



June 8, 2017

Reference No. 018224-2017

Ms. Carolyn Bury  
 U.S. EPA Region 5  
 LU 9J  
 77 West Jackson Blvd.  
 Chicago, IL 60604 3507

Dear Ms. Bury:

**Re: Biannual Monitoring Report – May 2017**  
**Halowax Area (Area 17) Interim Remedial Measure**  
**Arkema - East Plant**  
**Wyandotte, Michigan**

## 1. Introduction

On behalf of Legacy Site Services, LLC (LSS), Agent for Arkema Inc., GHD Services Inc. (GHD) has prepared this Halowax Area (Area 17) Interim Remedial Measure (IRM) Biannual Monitoring Report in accordance with the United States Environmental Protection Agency (U.S. EPA) approved Area 17 Biannual Monitoring Plan (BMP), dated April 10, 2015.

In accordance with the approved BMP, 2017 biannual events include hydraulicDNAPL monitoring of eight shallow monitoring wells (IRM-MW-1, IRM-MW-2, IRM-MW-3, MW009, MW010A, MW011, MW016 and MW025) and sampling of five monitoring wells (IRM-MW-1, IRM-MW-2, MW010A, MW016 and MW025). Refer to Figure 1 for the location of monitoring wells.

The objective of biannual sampling is to supplement the conclusions presented in the May 2010 Corrective Measures Study (CMS) Report which indicates that the current Area 17 IRM effectively contains, captures, recovers and treats (or disposes) impacted groundwater and DNAPL. To achieve this objective, select monitoring wells throughout Area 17 are to be sampled and gauged on a biannual basis to evaluate groundwater flow direction, DNAPL presence thickness and dissolved constituent concentrations.

In accordance with the approved QMP, the remaining sections of this report are presented as follows:

- Section 2 - Field Activities
- Section 3 - Laboratory Analysis and Data Validation
- Section 4 - Groundwater Analytical Results
- Section 5 - Summary and Conclusions



## 2. Field Activities

### 2.1 Fluid (Groundwater and DNAPL) Level Monitoring

To start the event, static water levels (using an OilWater Interface Probe) were collected from eight existing shallow monitoring wells in and near Area 17 to define flow conditions and investigate the presence of DNAPL. These wells included IRM-MW-1, IRM-MW-2, IRM-MW-3, MW009, MW010A, MW011, MW016, and MW025, as depicted on Figure 1. Monitoring wells MW017 and MW022, shown on Figure 1, are damaged and were not sampled as part of this event.

Prior to collection of measurements, monitoring well caps were removed and time was given to promote water table equalization. The elevation of the Trenton Channel was also obtained from the National Oceanic and Atmospheric Administration (NOAA) Wyandotte River Gauging Station ([http://grikesonline.nos.noaa.gov/glin.shtml?station\\_info=9044030+Wyandotte+MI](http://grikesonline.nos.noaa.gov/glin.shtml?station_info=9044030+Wyandotte+MI)).

Fluid levels collected as part of this activity are summarized in the following table:

Well ID	TOC Elevation	Water Level (ft btoc)	Depth to DNAPL (ft btoc)	TOS (ft btoc)	BOS (ft btoc)	BOW (ft btoc)	Water Elev.	DNAPL Elev.	DNAPL Thickness (ft)
IRM-MW-1	580.02	4.32	ND	12.25	17.25	22.25	575.10	ND	NA
IRM-MW-2	579.57	4.77	16.10	11.52	16.52	21.52	574.80	563.47	5.42
IRM-MW-3	579.30	4.60	ND	11.31	16.31	21.31	574.70	ND	NA
MW009	579.57	4.15	14.10	11.14	16.14	16.14	575.56	565.61	2.18
MW010a	579.76	2.95	ND	6.52	11.52	11.52	576.81	ND	NA
MW011	580.66	4.11	ND	5.17	10.17	10.17	576.55	ND	NA
MW016	579.29	3.58	ND	17.25	22.25	22.25	575.71	ND	NA
MW025	581.11	6.33	ND	16.91	21.91	21.91	574.78	ND	NA
SW <sup>(1)</sup>	NA	NA	NA	NA	NA	NA	573.61	NA	NA

**Table Notes:**

**Elevation Datum** - NAVD 88

**TOC** - Top of casing

**ft btoc** - feet below top of casing

**NA** - Not Applicable

**TOS** - approximate top of screen (feet below top of casing)

**BOS** - approximate bottom of screen (feet below top of casing)

**BOW** - approximate bottom of well (feet below top of casing)

<sup>(1)</sup> – Surface water elevation based on Wyandotte, MI station reading at 8:30 A.M. on 5/11/17; converted from IGLD 85 to NAVD 88 elevation using -0.265ft conversion factor. Elevation is approximate.

Data presented in the table were used to develop groundwater flow contours and to document DNAPL conditions. As shown on Figure 1, groundwater was found to flow in an easterly direction at the time of the event, which is consistent with the previous observations of shallow groundwater flow in Area 17.



As shown in the above table, DNAPL was encountered in IRM-MW-2 and MW009 only. This is consistent with previous gauging events (DNAPL has only been observed in these two wells since initiation of RCRA Corrective Action Activities). The DNAPL thicknesses in MW009 and IRM-MW-2 were similar compared to the November 2016 sampling event.

## **2.2 DNAPL Recovery**

During monitoring well gauging GHD extracted recoverable DNAPL from IRM-MW-2 and MW009 using a peristaltic pump and dedicated tubing; a total of 18 gallon was recovered during the effort and placed in DNAPL waste drums which are staged adjacent to the treatment system building. Low recovery of DNAPL is due to the nature of the product, which can be very viscous (tar-like) and difficult to extract.

## **2.3 Monitoring Well Sampling**

Sampling of the monitoring well network was completed in accordance with GHD's Field Method Guidelines (FMGs) for Groundwater Sample Purging and Collection Procedures. Tubing used for sampling was dedicated to each monitoring well to prevent potential cross contamination, to eliminate decontamination of tubing and to facilitate follow up sampling rounds. All water generated during well purging efforts was processed through the Area 17 groundwater treatment system.

During sampling, the water level and pumping rates were recorded every 3 to 5 minutes (or less, depending on the recharge rate of the monitoring well) and the groundwater was monitored with a flow through cell for field parameters including dissolved oxygen (DO), oxidation reduction potential (ORP), pH, specific conductance, turbidity, and temperature. After the field parameters stabilized, groundwater samples were collected using laboratory supplied glass containers, starting with VOCs. Field quality control samples were also collected during the sampling event and consisted of one trip blank, one duplicate and one matrix spikematrix spike duplicate (MS MSD). Upon collection, samples were immediately placed in a cooler on ice for shipment to the analytical laboratory under chain of custody (COC) protocol. Refer to Attachment A for copies of Low Flow Purging Forms and Table 1 for a Sample Key.

## **3. Laboratory Analysis and Data Validation**

Groundwater samples collected for chemical analysis were submitted to TestAmerica Laboratories under COC protocol and all samples were analyzed under standard turnaround time (2 weeks) for Target Compound List (TCL) volatile organic compounds (VOCs) by SW846, Method 8260 and TCL semi volatile organic compounds (SVOCs) by SW846, Method 8270.

**Quality Assurance Quality Control (QAQC)** procedures were conducted by the laboratory during sample analyses. A review of the analytical data package was also performed to validate results and to determine usability. The validation was performed by project chemists experienced in laboratory methods and validation procedures, and did not include those persons directly involved with the analyses. The data



validation was performed in general accordance with criteria established in federal guidelines. Refer to Attachment B for a memorandum describing Data Quality Assessment and Validation.

#### 4. Groundwater Analytical Results

Results of the groundwater analyses are provided in the laboratory analytical reports contained in Attachment C and are summarized in Table 2. Analytical results presented in Table 2 are compared to Michigan Act 451, Part 201 Generic Nonresidential Cleanup Criteria (GNRCC).

Consistent with the November 2016 sampling event, various constituents were detected above criteria protective of the drinking water pathway or the groundwater surface water interface (GSI) in IRM-MW-1, IRM-MW-2, and MW010A. However, a restrictive covenant prohibits use of groundwater for drinking water purposes and migration to surface water is precluded by the Area 17 groundwater containment and collection system. As such, the drinking water and GSI pathways are not complete for those wells and the associated exceedances do not present unacceptable exposures.

No constituents were detected above applicable GNRCC in MW016.

With the exception of chlorobenzene (0.035 mg/l), detected slightly above GSI criteria (0.025 mg/l), no constituents were detected in MW025 at concentrations above applicable GNRCC.

#### 5. Summary and Conclusions

GHD conducted the May 2017 monitoring of the Area 17 IRM in accordance with the U.S. EPA approved BMP, dated April 10, 2015. Activities included hydraulic DNAPL monitoring of eight shallow monitoring wells (IRM-MW-1, IRM-MW-2, IRM-MW-3, MW009, MW010A, MW011, MW016 and MW025) and sampling of five shallow monitoring wells (IRM-MW-1, IRM-MW-2, MW010A, MW016 and MW025) to evaluate groundwater flow direction, DNAPL presence thickness and dissolved constituent concentrations.

As identified herein, groundwater was found to flow in an easterly direction, which is consistent with previous estimates of shallow groundwater flow in Area 17 and provides evidence that Area 17 impacts will migrate toward the containment wall where they would be intercepted, extracted and treated.

Groundwater flow direction will continue to be monitored during future sampling events to further evaluate seasonal variations in groundwater flow.

DNAPL was encountered in IRM-MW-2 and MW009 only, which is consistent with previous gauging events and provides continued evidence that the DNAPL plume is not expanding. Both locations showed similar DNAPL thicknesses compared to the November 2016 event when measured with an oil water interface probe.

Cross sectional diagrams were updated during preparation of this report to reflect field measured groundwater and DNAPL depths. Figures 2, 3 and 4 present cross sectional diagrams of the Area 17 hydrogeologic profile, which show an easterly sloping clay layer. This provides evidence that, if present,



mobile and migrating DNAPL would flow along the top of the clay layer (dipping to the east – toward the containment wall) and be contained.

Results of the groundwater analyses show that various constituents were detected in IRM-MW-1, IRM-MW-2 and MW010A. However, based on their location and institutional controls in place at the Site, the constituents do not present the potential for unacceptable exposures.

No constituents were detected above applicable GNRCC in MW016. Additionally, with the exception of chlorobenzene (0.035 mg/l), slightly above GSI criteria (0.025 mg/l), no constituents were detected in MW025 at concentrations above GNRCC. The concentration of chlorobenzene in MW025, which appears to fluctuate from non-detect to slightly above GSI, is consistent with several previous events.

We trust that this report satisfies your requirements at this time. If you should have any questions or comments or require further clarification, please contact Mr. Michael Pinto at (610) 594-4435.

Sincerely,

GHD

A handwritten signature in blue ink, appearing to read "Peter S. Swanson".

Peter S. Swanson, P.E.

DC/pss/11/Det.

Encls: Figure 1 - Site Layout and Groundwater Contours

Figure 2 - Cross Section Location Map

Figure 3 - Cross Section A-A'

Figure 4 - Cross Section B-B'

Table 1 - Sample Key

Table 2 - Summary of Groundwater Analytical Results

Attachment A - Low Flow Purging Forms

Attachment B - Data Quality Assessment and Validation Memorandum

Attachment C - Laboratory Analytical Reports

cc: Michael Pinto, LSS

Tracy Kecskemeti, MDEQ

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Joanne West, Union Carbide

Michael Bollinger, Beazer East

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## **Figures**

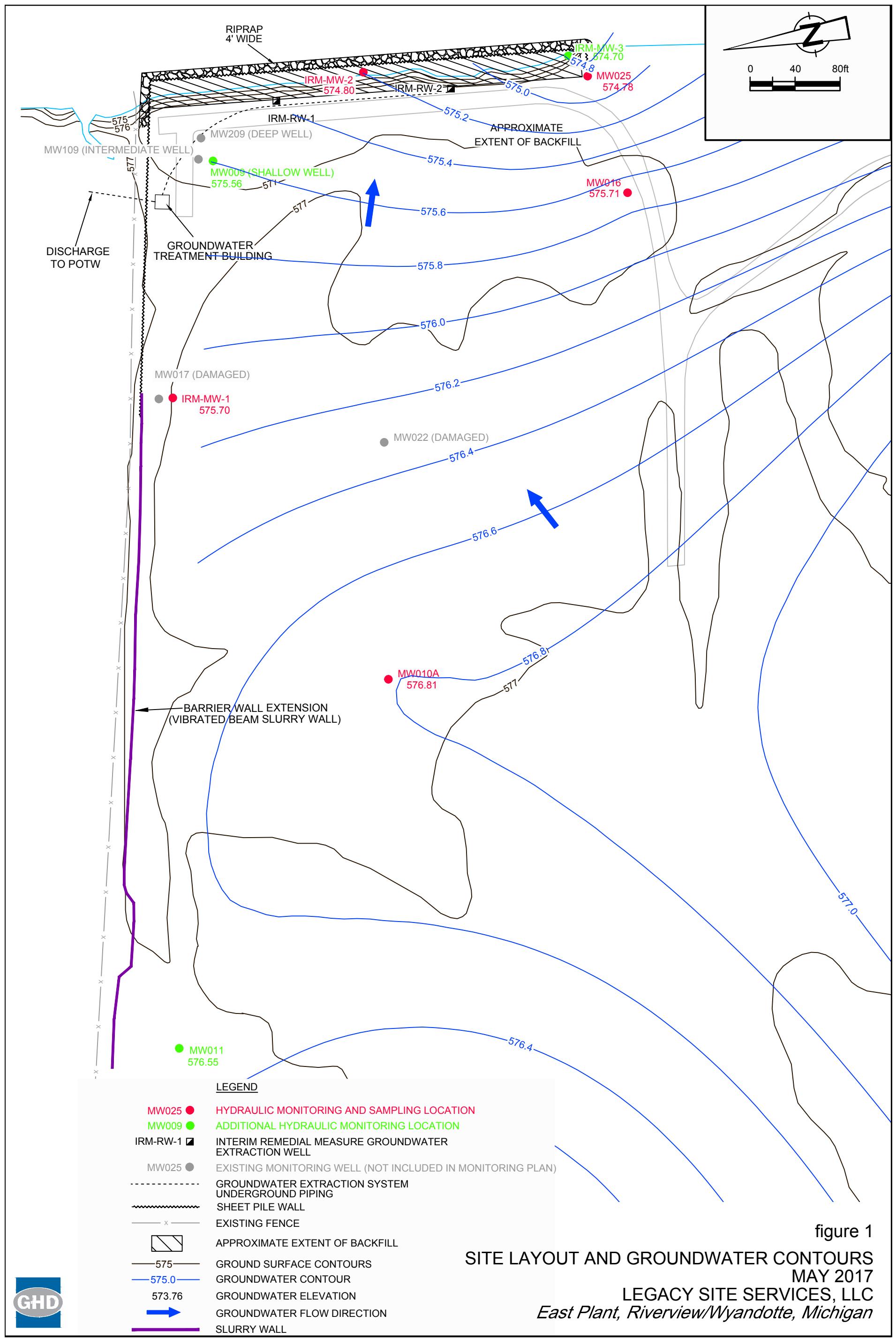
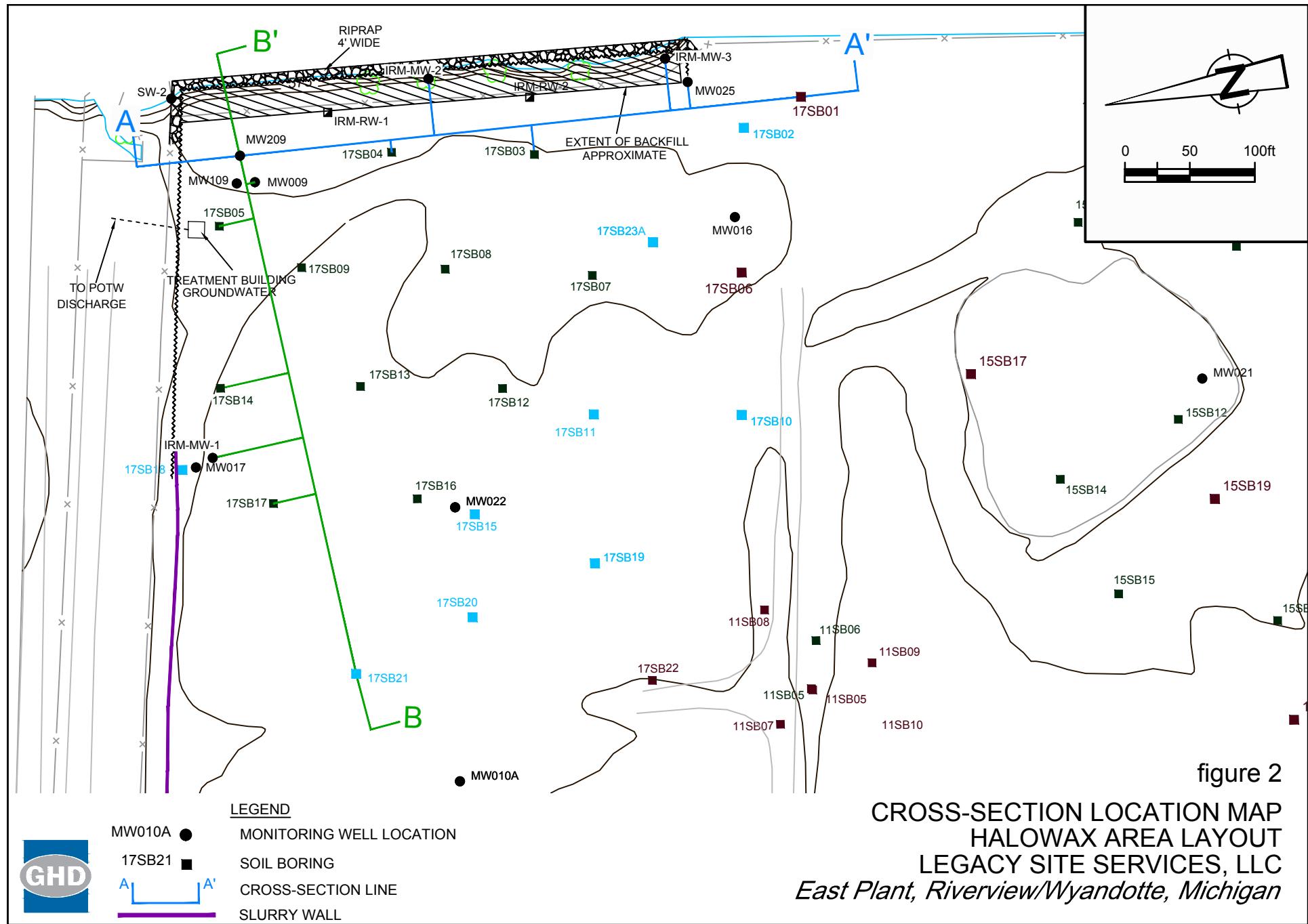
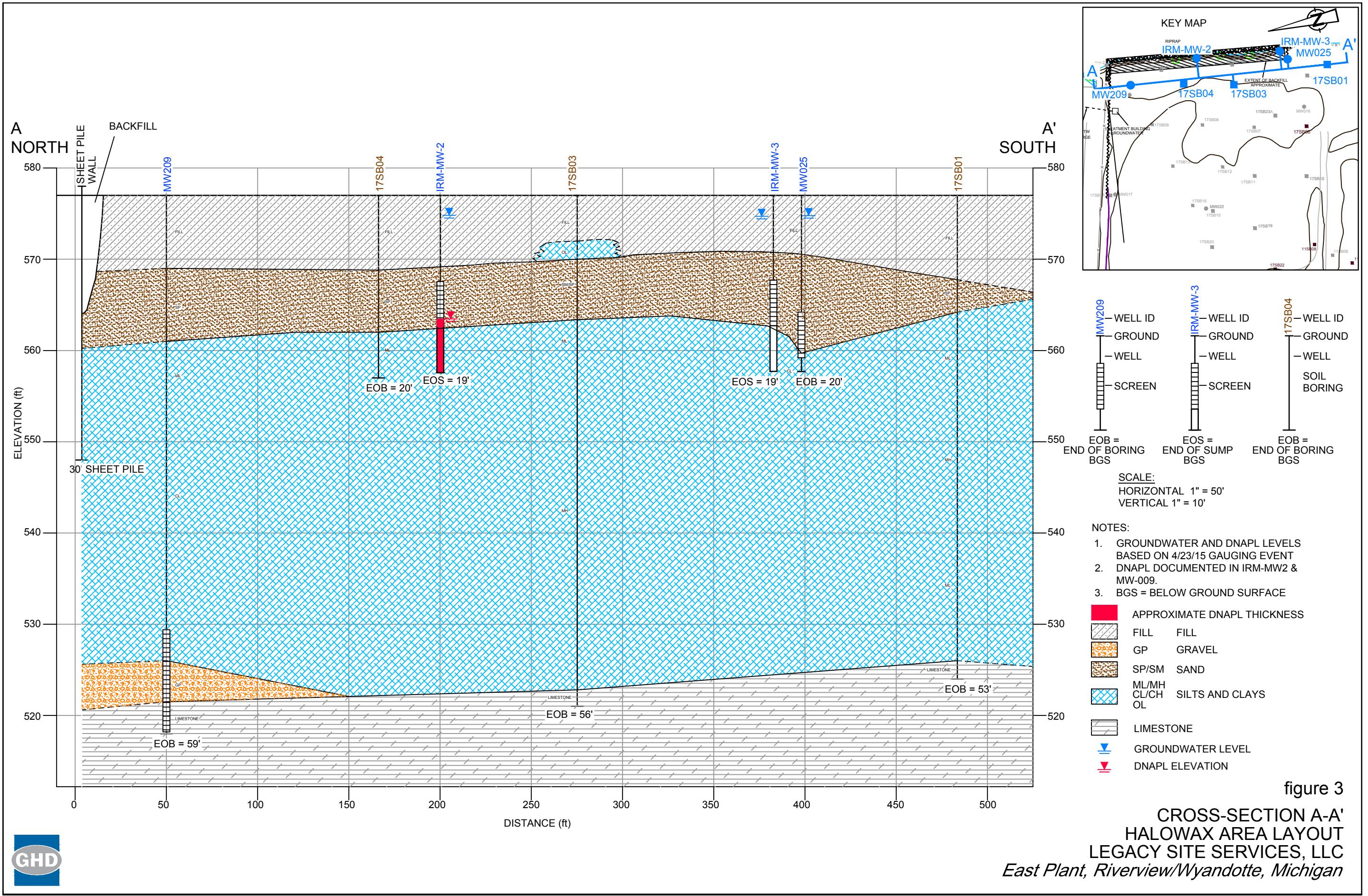


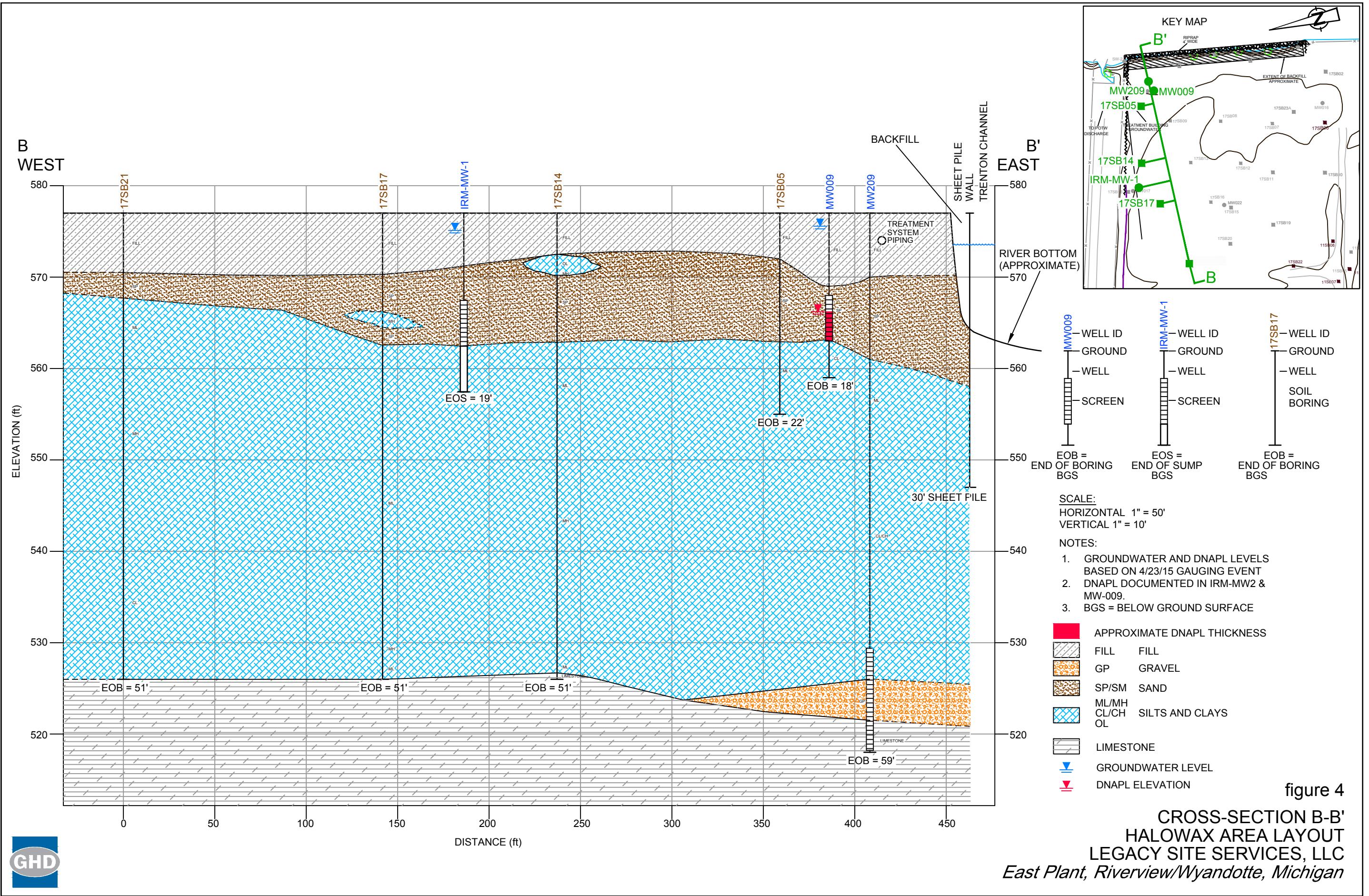
figure 1

SITE LAYOUT AND GROUNDWATER CONTOURS  
MAY 2017  
LEGACY SITE SERVICES, LLC  
*East Plant, Riverview/Wyandotte, Michigan*









## **Tables**

Table 1

Groundwater Sample Key  
 May 2017 Biannual Sampling Event  
 Arkema East Plant - Halowax Area  
 Wyandotte, Michigan

<b>Sample Identification</b>	<b>Sample Location</b>	<b>Date</b>	<b>QA/QC</b>	<b>Analysis</b>
GW-18224-050117-DC-001	IRM-MW-1	5/1/2017	--	VOCs, SVOCs
GW-18224-050117-DC-002	IRM-MW-1	5/1/2017	Duplicate	VOCs, SVOCs
GW-18224-050117-DC-003	MW010A	5/1/2017	MS/MSD	VOCs, SVOCs
GW-18224-050117-DC-004	MW025	5/1/2017	--	VOCs, SVOCs
GW-18224-050117-DC-005	IRM-MW-2	5/1/2017	--	VOCs, SVOCs
GW-18224-050117-DC-006	MW016	5/1/2017	--	VOCs, SVOCs
TB-18224-050117	--	5/1/2017	Trip Blank	VOCs

**Notes:**

VOCs = Volatile Organic Compounds

SVOCs = Semi-Volatile Organic Compounds

MS/MSD = Matrix Spike/ Matrix Spike Duplicate

QA/QC = Quality Assurance/ Quality Control

Table 2

Summary of Groundwater Analytical Results  
May 2017 Biannual Sampling Event  
Arkema East Plant - Halowax Area  
Wyandotte, Michigan

Sample Location: Sample Identification: GW-18824 Sample Date: Sample Type:	MDEQ Generic Groundwater Cleanup Criteria: Nonresidential <sup>(1)</sup>					IRM-MW-1 -050117-DC-001 5/1/2017	IRM-MW-1 -050117-DC-002 5/1/2017 Duplicate	IRM-MW-2 -050117-DC-005 5/1/2017	MW010A -050117-DC-003 5/1/2017	MW016 -050117-DC-006 5/1/2017	MW025 -050117-DC-004 5/1/2017
	Non-Residential Drinking Water	Groundwater Surface Water Interface	Non-Residential Volatileization to Indoor Air Inhalation	Water Solubility	Flammability and Explosivity Screening Levels						
Units	a	b	c	d	e						
<b>Volatile Organic Compounds (VOC)</b>											
1,1,1-Trichloroethane	mg/L	0.2	0.089	1300	1330	ID	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
1,1,2,2-Tetrachloroethane	mg/L	0.035	0.078	77	2970	ID	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
1,1,2-Trichloroethane	mg/L	0.005	0.33	110	4420	--	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
1,1-Dichloroethane	mg/L	2.5	0.74	2300	5060	380	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
1,1-Dichloroethene	mg/L	0.007	0.13	1.3	2250	97	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
1,2,4-Trichlorobenzene	mg/L	0.07	0.099	300	300	--	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
1,2-Dibromo-3-chloropropane (DBCP)	mg/L	0.0002	--	1.2	1.23	--	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
1,2-Dibromoethane (Ethylene dibromide)	mg/L	0.00005	0.0057	15	4200	ID	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
1,2-Dichlorobenzene	mg/L	0.6	0.013	160	156	--	0.033 U	0.033 U	<b>0.03<sup>b</sup></b>	0.008 U	0.0033 U
1,2-Dichloroethane	mg/L	0.005	0.36	59	8520	2500	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
1,2-Dichloropropane	mg/L	0.005	0.23	36	2800	550	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
1,3-Dichlorobenzene	mg/L	0.019	0.028	41	111	ID	0.033 U	0.033 U	<b>0.033<sup>ab</sup></b>	0.008 U	0.0033 U
1,4-Dichlorobenzene	mg/L	0.075	0.017	74	73.8	--	0.033 U	0.033 U	<b>0.17<sup>ab</sup></b>	0.008 U	0.0033 U
2-Butanone (Methyl ethyl ketone) (MEK)	mg/L	38	2.2	240000	240000	ID	0.33 U	0.33 U	0.25 U	0.08 U	0.033 U
2-Hexanone	mg/L	2.9	ID	8700	16000	--	0.33 U	0.33 U	0.25 U	0.08 U	0.033 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	mg/L	5.2	ID	20000	20000	ID	0.33 U	0.33 U	0.25 U	0.08 U	0.033 U
Acetone	mg/L	2.1	1.7	1000000	1000000	15000	0.33 U	0.33 U	0.25 U	0.08 U	0.033 U
Benzene	mg/L	0.005	0.2	35	1750	68	0.033 U	0.033 U	<b>0.34<sup>ab</sup></b>	0.008 U	0.0033 U
Bromodichloromethane	mg/L	0.08	ID	37	6740	ID	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
Bromoform	mg/L	0.08	ID	3100	3100	ID	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
Bromomethane (Methyl bromide)	mg/L	0.029	0.035	9	14500	ID	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
Carbon disulfide	mg/L	2.3	ID	550	1190	13	0.17 U	0.17 U	0.13 U	0.04 U	0.017 U
Carbon tetrachloride	mg/L	0.005	0.045	2.4	793	ID	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
Chlorobenzene	mg/L	0.1	0.025	470	472	160	0.033 U	0.033 U	<b>0.66<sup>ab</sup></b>	0.008 U	0.0033 U
Chloroethane	mg/L	1.7	1.1	5700	5740	110	0.033 U	0.033 U	0.025 U	0.008 U	0.057
Chloroform (Trichloromethane)	mg/L	0.08	0.35	180	7920	ID	<b>0.92<sup>ab</sup></b>	<b>0.87<sup>ab</sup></b>	0.025 U	0.008 U	0.0033 U
Chloromethane (Methyl chloride)	mg/L	1.1	ID	45	6340	36	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
cis-1,2-Dichloroethene	mg/L	0.07	0.62	210	3500	530	<b>0.081<sup>a</sup></b>	<b>0.081<sup>a</sup></b>	0.025 U	<b>0.26<sup>a</sup></b>	0.0033 U
cis-1,3-Dichloropropene	mg/L	--	--	--	--	--	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
Cyclohexane	mg/L	--	--	--	--	--	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
Dibromochloromethane	mg/L	0.08	ID	110	2600	ID	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
Dichlorodifluoromethane (CFC-12)	mg/L	4.8	ID	300	300	ID	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
Ethylbenzene	mg/L	0.074	0.018	170	169	43	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
Isopropyl benzene	mg/L	2.3	0.028	56	56	29	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
Methyl acetate	mg/L	--	--	--	--	--	0.33 U	0.33 U	0.25 U	0.08 U	0.033 U
Methyl cyclohexane	mg/L	--	--	--	--	--	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
Methyl tert butyl ether (MTBE)	mg/L	0.04	7.1	47000	46800	ID	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
Methylene chloride	mg/L	0.005	1.5	1400	17000	ID	0.17 U	0.17 U	0.13 U	0.04 U	0.017 U
Styrene	mg/L	0.1	0.08	310	310	140	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
Tetrachloroethene	mg/L	0.005	0.06	170	200	ID	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
Toluene	mg/L	0.79	0.27	530	526	61	0.033 U	0.033 U	0.082	0.008 U	0.0033 U
trans-1,2-Dichloroethene	mg/L	0.1	1.5	200	6300	230	0.033 U	0.033 U	0.025 U	0.042	0.0033 U
trans-1,3-Dichloropropene	mg/L	--	--	--	--	--	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
Trichloroethene	mg/L	0.005	0.2	4.9	1100	ID	0.033 U	0.033 U	0.025 U	<b>0.019<sup>a</sup></b>	0.0033 U
Trichlorofluoromethane (CFC-11)	mg/L	7.3	--	1100	1100	ID	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
Trifluorotrichloroethane (CFC-113)	mg/L	170	0.032	170	170	ID	0.033 U	0.033 U	0.025 U	0.008 U	0.0033 U
Vinyl chloride	mg/L	0.002	0.013	13	2760	33	<b>0.064<sup>ab</sup></b>	<b>0.062<sup>ab</sup></b>	0.025 U	<b>0.099<sup>ab</sup></b>	0.0033 U
Xylenes (total)	mg/L	0.28	0.041	190	186	70	0.067 U	0.067 U	0.05 U	0.016 U	0.0067 U

Table 2

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Sample Location: Sample Identification: GW-18824 Sample Date: Sample Type:	MDEQ Generic Groundwater Cleanup Criteria: Nonresidential <sup>(1)</sup>					IRM-MW-1 -050117-DC-001 5/1/2017	IRM-MW-1 -050117-DC-002 5/1/2017 Duplicate	IRM-MW-2 -050117-DC-005 5/1/2017	MW010A -050117-DC-003 5/1/2017	MW016 -050117-DC-006 5/1/2017	MW025 -050117-DC-004 5/1/2017		
	Non-Residential Drinking Water	Groundwater Surface Water Interface	Non-Residential Volatilization to Indoor Air Inhalation	Water Solubility	Flammability and Explosivity Screening Levels								
Units	a	b	c	d	e								
<b>Semi-Volatile Organic Compounds (SVOCs)</b>													
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	mg/L					0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U		
2,4,5-Trichlorophenol	mg/L	2.1	--	NLV	1200	ID	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U	
2,4,6-Trichlorophenol	mg/L	0.47	0.005	NLV	800	ID	0.0038 U	0.0038 U	0.019 U	0.0043 U	0.004 U	0.0038 U	
2,4-Dichlorophenol	mg/L	0.21	0.011	NLV	4500	ID	0.0095 U	0.0095 U	0.048 U	0.011 U	0.01 U	0.0095 U	
2,4-Dimethylphenol	mg/L	1	0.38	NLV	7870	ID	0.0048 U	0.0048 U	0.043	0.0053 U	0.005 U	0.0048 U	
2,4-Dinitrophenol	mg/L	--	--	--	--	--	0.019 U	0.019 U	0.095 U	0.021 U	0.02 U	0.019 U	
2,4-Dinitrotoluene	mg/L	0.032	--	NLV	270	ID	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U	
2,6-Dinitrotoluene	mg/L	--	--	--	--	--	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U	
2-Chloronaphthalene	mg/L	5.2	--	ID	6.74	ID	0.0048 U	0.0048 U	0.091	0.0053 U	0.005 U	0.0048 U	
2-Chlorophenol	mg/L	0.13	0.018	ID	22000	ID	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U	
2-Methylnaphthalene	mg/L	0.75	0.019		25	24.6	ID	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U
2-Methylphenol	mg/L	1	0.03	NLV	28000	--	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U	
2-Nitroaniline	mg/L	--	--	--	--	--	0.019 U	0.019 U	0.095 U	0.021 U	0.02 U	0.019 U	
2-Nitrophenol	mg/L	0.058	ID	NLV	2500	ID	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U	
3&4-Methylphenol	mg/L	1	0.03	NLV	28000	--	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U	
3,3'-Dichlorobenzidine	mg/L	0.0043	0.0003	NLV	3.11	ID	0.00095 U	0.00095 U	0.0048 U	0.0011 U	0.001 U	0.00095 U	
3-Nitroaniline	mg/L	--	--	--	--	--	0.019 U	0.019 U	0.095 U	0.021 U	0.02 U	0.019 U	
4,6-Dinitro-2-methylphenol	mg/L	0.02	--	NLV	200	ID	0.019 U	0.019 U	0.095 U	0.021 U	0.02 U	0.019 U	
4-Bromophenyl phenyl ether	mg/L	--	--	--	--	--	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U	
4-Chloro-3-methylphenol	mg/L	0.42	0.0074	NLV	3900	ID	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U	
4-Chloroaniline	mg/L	--	--	--	--	--	0.0095 U	0.0095 U	0.048 U	0.011 U	0.01 U	0.0095 U	
4-Chlorophenyl phenyl ether	mg/L	--	--	--	--	--	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U	
4-Nitroaniline	mg/L	--	--	--	--	--	0.019 U	0.019 U	0.095 U	0.021 U	0.02 U	0.019 U	
4-Nitrophenol	mg/L	--	--	--	--	--	0.019 U	0.019 U	0.095 U	0.021 U	0.02 U	0.019 U	
Acenaphthene	mg/L	3.8	0.038		4.2	4.24	ID	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U
Acenaphthylene	mg/L	0.15	ID		3.9	3.93	ID	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U
Acetophenone	mg/L	4.4	--	6100	6100	ID	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U	
Anthracene	mg/L	0.043	ID		0.043	0.0434	ID	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U
Atrazine	mg/L	0.003	0.0073	NLV	70	ID	0.0029 U	0.0029 U	0.014 U	0.0032 U	0.003 U	0.0029 U	
Benzaldehyde	mg/L	--	--	--	--	--	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U	
Benzo(a)anthracene	mg/L	0.0085	ID	NLV	0.0094	ID	0.00095 U	0.00095 U	0.0048 U	0.0011 U	0.001 U	0.00095 U	
Benzo(a)pyrene	mg/L	0.005	ID	NLV	0.00162	ID	0.00095 U	0.00095 U	0.0048 U	0.0011 U	0.001 U	0.00095 U	
Benzo(b)fluoranthene	mg/L	0.0015	ID		0.0015	ID	0.00095 U	0.00095 U	0.0048 U	0.0011 U	0.001 U	0.00095 U	
Benzo(g,h,i)perylene	mg/L	0.001	--	NLV	0.00026	ID	0.00095 U	0.00095 U	0.0048 U	0.0011 U	0.001 U	0.00095 U	
Benzo(k)fluoranthene	mg/L	0.001	--	NLV	0.0008	ID	0.00095 U	0.00095 U	0.0048 U	0.0011 U	0.001 U	0.00095 U	
Biphenyl (1,1-Biphenyl)	mg/L	--	--	--	--	--	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U	
bis(2-Chloroethoxy)methane	mg/L	--	--	--	--	--	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U	
bis(2-Chloroethyl)ether	mg/L	0.0083	0.001		210	17200	17000	0.00095 U	0.00095 U	0.0048 U	0.0011 U	0.001 U	0.00095 U
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	0.006	0.025	NLV	0.34	--	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U	
Butyl benzylphthalate (BBP)	mg/L	2.7	0.067	NLV	2.69	ID	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U	
Caprolactam	mg/L	17	--	NLV	5250000	--	0.0095 U	0.0095 U	0.048 U	0.011 U	0.01 U	0.0095 U	
Carbazole	mg/L	0.35	0.01	NLV	7.48	ID	0.0095 U	0.0095 U	0.048 U	0.011 U	0.01 U	0.0095 U	
Chrysene	mg/L	0.0016	ID		0.0016	ID	0.00095 U	0.00095 U	0.0048 U	0.0011 U	0.001 U	0.00095 U	
Dibenzo(a,h)anthracene	mg/L	0.002	ID	NLV	0.00249	ID	0.0019 U	0.0019 U	0.0095 U	0.0021 U	0.002 U	0.0019 U	
Dibenzofuran	mg/L	ID	0.004		10	10	ID	0.0038 U	0.0038 U	0.019 U	0.0043 U	0.004 U	0.0038 U
Diethyl phthalate	mg/L	16	0.11	NLV	1080	--	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U	
Dimethyl phthalate	mg/L	210	--	NLV	4190	--	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U	
Di-n-butylphthalate (DBP)	mg/L	2.5	0.0097	NLV	11.2	--	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U	
Di-n-octyl phthalate (DnOP)	mg/L	0.38	ID	NLV	3	ID	0.0048 U	0.0048 U	0.024 U	0.0053 U	0		

Table 2

Summary of Groundwater Analytical Results  
May 2017 Biannual Sampling Event  
Arkema East Plant - Halowax Area  
Wyandotte, Michigan

Sample Location: Sample Identification: GW-18824 Sample Date: Sample Type:	MDEQ Generic Groundwater Cleanup Criteria: Nonresidential <sup>(1)</sup>						IRM-MW-1 -050117-DC-001 5/1/2017	IRM-MW-1 -050117-DC-002 5/1/2017 Duplicate	IRM-MW-2 -050117-DC-005 5/1/2017	MW010A -050117-DC-003 5/1/2017	MW016 -050117-DC-006 5/1/2017	MW025 -050117-DC-004 5/1/2017
	Non-Residential Drinking Water	Groundwater Surface Water	Non-Residential Interface	Groundwater Volatileization to Indoor Air Inhalation	Water Solubility	Flammability and Explosivity Screening Levels						
Units	a	b	c	d	e							
<b>Semi-Volatile Organic Compounds (SVOCs) Continued</b>												
Naphthalene	mg/L	1.5	0.011	31	31	--	0.0048 U	0.0048 U	<b>0.12<sup>b</sup></b>	0.0053 U	0.005 U	0.0048 U
Nitrobenzene	mg/L	0.0096	0.18	550	2090	--	0.0029 U	0.0029 U	0.014 U	0.0032 U	0.003 U	0.0029 U
N-Nitrosodi-n-propylamine	mg/L	0.005	--	NLV	9890	ID	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U
N-Nitrosodiphenylamine	mg/L	1.1	--	NLV	35.1	ID	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U
Pentachlorophenol	mg/L	0.001	0.0018	NLV	1850	ID	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U
Phenanthrene	mg/L	0.15	0.002	1	1	ID	0.0019 U	0.0019 U	0.0095 U	0.0021 U	0.002 U	0.0019 U
Phenol	mg/L	13	0.45	NLV	82800	--	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U
Pyrene	mg/L	0.14	ID	0.14	0.135	ID	0.0048 U	0.0048 U	0.024 U	0.0053 U	0.005 U	0.0048 U

## Notes:

<sup>(1)</sup> MDEQ (Michigan) Generic groundwater cleanup criteria, administrative rule R 299.44 effective December 30, 2013, pursuant to Part 201 of 1994

PA 451 as amended (Part 201 Groundwater Criteria)

mg/L - milligrams per liter (parts per million)

U - Not detected at the associated reporting limit.

-- - Criterion does not exist

## **Attachment A**

# **Low-Flow Purging Record Forms**

**Monitoring Well Record for Low-Flow Purging  
(Form SP-09)**

### **Project Data:**

Project Name: Arkeng Haliway Area  
Ref. No.: 01824-2013

Date: 5/1/17  
Personnel: D. Campbell

#### **Monitoring Well Data:**

Well No.: 2RM-*nw*-1

**Vapour PID (ppm):**

**Measurement Point:**

Constructed Well Depth (m/ft):

Measured Well Depth (m/ft): \_\_\_\_\_

**Depth of Sediment (m/ft):** \_\_\_\_\_

**Saturated Screen Length (m/ft):**

**Depth to Pump Intake (m/ft):** \_\_\_\_\_

**Well Diameter, D (cm/in):**

Well Screen Volume, V- (l) <sup>(2)</sup>:

[Initial Depth to Water (m/ft): 9.82

Initial Depth to Water (in/ft): 7.52

Start: 9:00

### Notes:

- (1) The pump intake will be placed at the well screen mid-point or at a minimum of 0.6 m (2 ft) above any sediment accumulated at the well bottom.
  - (2) The well screen volume will be based on a 1.52 metres (5-foot) screen length (L). For metric units,  $V_s = \pi * (r^2) * L$  in mL, where r ( $r=D/2$ ) and L are in cm. For Imperial units,  $V_s = \pi * (r^2) * L * (2.54)^3$ , where r and L are in inches
  - (3) The drawdown from the initial water level should not exceed 0.1 m (0.3 ft). The pumping rate should not exceed 600 mL/min.
  - (4) Purging will continue until stabilization is achieved or until 20 well screen volumes have been purged (unless purge water remains visually turbid and appears to be clearing, or unless stabilization parameters are varying slightly outside of the stabilization criteria and appear to be stabilizing), No. of Well Screen Volumes Purged=  $V_p/V_s$ .
  - (5) For conductivity, the average value of three readings  $<1 \text{ mS/cm} \pm 0.005 \text{ mS/cm}$  or where conductivity  $>1 \text{ mS/cm} \pm 0.01 \text{ mS/cm}$ .

m. Sample ID:  
6U-18224-050117-D(-001/002  
(Dop))

**Monitoring Well Record for Low Flow Purging  
(Form SP-09)**

### Project Data:

Project Name: Ankena - East Plan  
Ref. No.: efft 018224

Date: 5-1-17  
Personnel: D. R. Wren

### **Monitoring Well Data:**

Well No.: MW-12A

#### Vapour PID (ppm):

Measurement Point: Top

#### **Constructed Well Depth (m/ft)**

#### Measured Well Depth (m/ft):

**Saturated Screen Length (m/ft):**

### **Depth to Pump Intake (m/ft)<sup>(1)</sup>:**

Well Diameter, D (cm/in): 2-1/8

Well Screen Volume,  $V_s$  (L)<sup>(2)</sup>:

**Initial Depth to Water (m/ft):** 2.95

### Notes:

state 1125

- (1) The pump intake will be placed at the well screen mid-point or at a minimum of 0.6 m (2 ft) above any sediment accumulated at the well bottom.

(2) The well screen volume will be based on a 1.52 metres (5-foot) screen length (L). For metric units,  $V_s = \pi * (r^2) * L$  in mL, where r ( $r=D/2$ ) and L are in cm. *Sample 16 - 003*  
For Imperial units,  $V_s = \pi * (r^2) * L * (2.54)^3$ , where r and L are in inches

(3) The drawdown from the initial water level should not exceed 0.1 m (0.3 ft). The pumping rate should not exceed 600 mL/min.

(4) Purging will continue until stabilization is achieved or until 20 well screen volumes have been purged (unless purge water remains visually turbid and appears to be clearing, or unless stabilization parameters are varying slightly outside of the stabilization criteria and appear to be stabilizing), No. of Well Screen Volumes Purged=  $V_p/V_s$ .

(5) For conductivity, the average value of three readings  $<1 \text{ mS/cm} \pm 0.005 \text{ mS/cm}$  or where conductivity  $>1 \text{ mS/cm} \pm 0.01 \text{ mS/cm}$ .

**Monitoring Well Record for Low-Flow Purging  
(Form SP-09)**

### Project Data:

Project Name: Arkansas Melanox Area  
Ref. No.: 01/224-2013

Date: 5/1/17  
Personnel: D. C. Gandy

### **Monitoring Well Data:**

Well No.: MW-0245

Vapour PID (ppm):

**Measurement Point:**

**Constructed Well Depth (m/ft):**

**Measured Well Depth (m/ft):** \_\_\_\_\_

Measured Water Depth (m/ft): \_\_\_\_\_

Saturated Screen Length (m/ft):

Depth to Pump Intake (m/ft) \_\_\_\_\_

Well Diameter, D (cm/in):

Well Diameter, D (cm/mm): \_\_\_\_\_

Initial Depth to Water (m/ft): 133

Initial Depth to Water (m/ft). 6.33

Stock, 10:52

## Notes:

- (1) The pump intake will be placed at the well screen mid-point or at a minimum of 0.6 m (2 ft) above any sediment accumulated at the well bottom.

(2) The well screen volume will be based on a 1.52 metres (5-foot) screen length (L). For metric units,  $V_s = \pi * (r^2) * L$  in mL, where r ( $r=D/2$ ) and L are in cm. For Imperial units,  $V_s = \pi * (r^2) * L * (2.54)^3$ , where r and L are in inches.

(3) The drawdown from the initial water level should not exceed 0.1 m (0.3 ft). The pumping rate should not exceed 600 mL/min.

(4) Purging will continue until stabilization is achieved or until 20 well screen volumes have been purged (unless purge water remains visually turbid and appears to be clearing, or unless stabilization parameters are varying slightly outside of the stabilization criteria and appear to be stabilizing), No. of Well Screen Volumes Purged=  $V_p/V_s$ .

(5) For conductivity, the average value of three readings  $<1 \text{ mS/cm} \pm 0.005 \text{ mS/cm}$  or where conductivity  $>1 \text{ mS/cm} \pm 0.01 \text{ mS/cm}$ .

Sample IPI

FL-1824-050117-0C-004

**Monitoring Well Record for Low-Flow Purging  
(Form SP-09)**

### **Project Data:**

Project Name: Arkane Labours  
Ref. No.: 018224-2017

Date: 5/1/17  
Personnel: D. Goffel W.

### **Monitoring Well Data:**

Well No.: IR-A-14-2

Vapour PID (ppm):

#### **Measurement Point:**

**Constructed Well Depth (m/ft):**

Measured Well Depth (m/ft):

Depth of Sediment (m/ft):

**Saturated Screen Length (m/ft):**

Depth to Pump Intake (m/ft) \_\_\_\_\_

**Well Diameter, D (cm/in):**

Well Diameter, D (cm): \_\_\_\_\_

Initial Depth to Water (m/ft): 14.33

4-22

- Stock: 1312

### Notes:

- (1) The pump intake will be placed at the well screen mid-point or at a minimum of 0.6 m (2 ft) above any sediment accumulated at the well bottom.

(2) The well screen volume will be based on a 1.52 metres (5-foot) screen length (L). For metric units,  $V_s = \pi * (r^2) * L$  in mL, where r ( $r=D/2$ ) and L are in cm. For Imperial units,  $V_s = \pi * (r^2) * L * (2.54)^3$ , where r and L are in inches

(3) The drawdown from the initial water level should not exceed 0.1 m (0.3 ft). The pumping rate should not exceed 600 mL/min.

(4) Purging will continue until stabilization is achieved or until 20 well screen volumes have been purged (unless purge water remains visually turbid and appears to be clearing, or unless stabilization parameters are varying slightly outside of the stabilization criteria and appear to be stabilizing), No. of Well Screen Volumes Purged=  $V_p/V_s$ .

(5) For conductivity, the average value of three readings  $<1 \text{ mS/cm} \pm 0.005 \text{ mS/cm}$  or where conductivity  $>1 \text{ mS/cm} \pm 0.01 \text{ mS/cm}$ .

Sample ID:

6W-18224-050117Rx-005

## **Monitoring Well Record for Low-Flow Purging**

(Form SP-09)

### **Project Data:**

Project Name: Arkema - Hels X  
Ref. No.: 18224

Date: 5-1-17  
Personnel: D.B. (S)

### **Monitoring Well Data:**

Well No.: MW-616

Vapour PID (ppm):

**Measurement Point:** Tidwell

**Constructed Well Depth (m/ft):**

**Measured Well Depth (m/ft):**

**Depth of Sediment (m/ft):**

**Saturated Screen Length (m/ft):**

**Depth to Pump Intake (m/ft)<sup>(1)</sup>:**

**Well Diameter, D (cm/in):** 2 cm/in

**Well Screen Volume,  $V_e$  (L)<sup>(2)</sup>:**

**Initial Depth to Water (m/ft):** 3-58

### Notes:

- (1) The pump intake will be placed at the well screen mid-point or at a minimum of 0.6 m (2 ft) above any sediment accumulated at the well bottom.

(2) The well screen volume will be based on a 1.52 metres (5-foot) screen length (L). For metric units,  $V_s = \pi * (r^2) * L$  in mL, where r ( $r=D/2$ ) and L are in cm. For Imperial units,  $V_s = \pi * (r^2) * L * (2.54)^3$ , where r and L are in inches.

(3) The drawdown from the initial water level should not exceed 0.1 m (0.3 ft). The pumping rate should not exceed 600 mL/min.

(4) Purging will continue until stabilization is achieved or until 20 well screen volumes have been purged (unless purge water remains visually turbid and appears to be clearing, or unless stabilization parameters are varying slightly outside of the stabilization criteria and appear to be stabilizing), No. of Well Screen Volumes Purged=  $V_p/V_s$ .

(5) For conductivity, the average value of three readings  $<1 \text{ mS/cm} \pm 0.005 \text{ mS/cm}$  or where conductivity  $>1 \text{ mS/cm} \pm 0.01 \text{ mS/cm}$ .

start - 1355

sample # - 006

**Attachment B**  
**Data Quality Assessment**  
**and Validation Memorandum**



# Memorandum

May 30, 2017

To: Pete Swanson Ref. No.: 018224-2017

From: Nancy Bergstrom/tl/21/Det *NMB* Tel: 773-380-9933

**Subject:** Analytical Results and Reduced Validation  
2017 Semi-Annual Monitoring  
Arkema East Plant – Halowax Area  
Wyandotte/Riverview, Michigan  
May 2017

## 1. Introduction

This document details a reduced validation of analytical results for groundwater samples collected in support of the 2017 Semi-Annual Monitoring at the Arkema East Plant – Halowax Area Site during May 2017. Samples were submitted to TestAmerica Laboratories, Inc., located in North Canton, Ohio. A sample collection and analysis summary is presented in Table 1. The validated analytical results are summarized in Table 2. A summary of the analytical methodology is presented in Table 3.

Standard GHD report deliverables were submitted by the laboratory. The final results and supporting quality assurance/quality control (QA/QC) data were assessed. Evaluation of the data was based on information obtained from the chain of custody form, finished report forms, method blank data, recovery data from surrogate spikes/laboratory control samples (LCS)/matrix spikes (MS) and field QA/QC samples.

The QA/QC criteria by which these data have been assessed are outlined in the analytical methods referenced in Table 3 and applicable guidance from the documents entitled:

- i) "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", United States Environmental Protection Agency (USEPA) 540/R-99-008, October 1999

Item ii) will subsequently be referred to as the "Guidelines" in this Memorandum.

## 2. Sample Holding Time and Preservation

The sample holding time criteria for the analyses are summarized in Table 3. Sample chain of custody documents and analytical reports were used to determine sample holding times. All samples were prepared and analyzed within the required holding times.

All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (4 +/- 2°C).



### 3. Laboratory Method Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

All method blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation.

### 4. Surrogate Spike Recoveries - Organic Analyses

In accordance with the methods employed, all samples, blanks, and QC samples analyzed for organics are spiked with surrogate compounds prior to sample extraction and/or analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices.

All samples submitted for volatile organic compound (VOC) and semi-volatile organic compound (SVOC) determinations were spiked with the appropriate number of surrogate compounds prior to sample extraction and/or analysis.

Each individual surrogate compound is expected to meet the laboratory control limits with the exception of SVOC analyses. According to the "Guidelines" for SVOC analyses, up to one outlying surrogate in the base/neutral or acid fractions is acceptable as long as the recovery is at least 10 percent.

Surrogate recoveries were assessed against laboratory control limits. All surrogate recoveries were within the laboratory control limits.

### 5. Laboratory Control Sample (LCS) Analyses

LCS are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects.

For this study, LCS were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

The LCS contained all compounds of interest. Several VOC LCS recoveries exceeded the percent recovery criteria. These analytes were not detected in the associated investigative samples, therefore qualification of sample data was not required. All remaining LCS recoveries were within the laboratory control limits, demonstrating acceptable analytical accuracy.



## 6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

To evaluate the effects of sample matrices on the preparation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with a known concentration of the analyte of concern and analyzed as MS/MSD samples. The RPD between the MS and MSD is used to assess analytical precision.

MS/MSD analyses were performed as specified in Table 1.

The MS/MSD samples were spiked with all compounds of interest. All percent recoveries and RPD values were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision.

## 7. Field QA/QC Samples

The field QA/QC consisted of one trip blank sample and one field duplicate sample set.

### *Trip Blank Sample Analysis*

To evaluate contamination from sample collection, transportation, storage, and analytical activities, one trip blank was submitted to the laboratory for VOC analysis. All results were non-detect for the compounds of interest.

### *Field Duplicate Sample Analysis*

To assess the analytical and sampling protocol precision, one field duplicate sample was collected and submitted "blind" to the laboratory, as specified in Table 1. The RPDs associated with these duplicate samples must be less than 50 percent for water samples. If the reported concentration in either the investigative sample or its duplicate is less than five times the reporting limit (RL), the evaluation criteria is one times the RL value for water samples.

All field duplicate results were within acceptable agreement, demonstrating acceptable sampling and analytical precision.

## 8. Analyte Reporting

The laboratory reported detected results down to the laboratory's method detection limit (MDL) for each analyte. No positive analyte detections less than the RL but greater than the MDL were reported. Non-detect results were presented as non-detect at the RL in Table 2.

## 9. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are acceptable without qualification.

**Table 1**

**Sample Collection and Analysis Summary  
2017 Semi-Annual Monitoring  
Arkema East Plant - Halowax Area  
Wyandotte/Riverview, Michigan  
May 2017**

<b>Sample Identification</b>	<b>Location</b>	<b>Matrix</b>	<b>Collection Date (mm/dd/yyyy)</b>	<b>Collection Time (hr:min)</b>	<b>Analysis/Parameters</b>		<b>Comments</b>
					<b>TCL VOC</b>	<b>TCL SVOC</b>	
<b>TA-NC SDG No.: 240-78922-1</b>							
GW-18224-050117-DC-001	IRM-MW-1	Water	05/01/2017	10:05	X	X	FD (IRM-MW-1)
GW-18224-050117-DC-002	IRM-MW-1	Water	05/01/2017	10:20	X	X	
GW-18224-050117-DC-003	MW010A	Water	05/01/2017	12:15	X	X	MS/MSD
GW-18224-050117-DC-004	MW025	Water	05/01/2017	12:40	X	X	
GW-18224-050117-DC-005	IRM-MW-2	Water	05/01/2017	14:05	X	X	
GW-18224-050117-DC-006	MW016	Water	05/01/2017	14:45	X	X	
TB-18224-050117	-	Water	05/01/2017	-	X		TB

## Notes:

- FD - Field Duplicate sample of sample in parenthesis
- MS/MSD - Matrix Spike/Matrix Spike Duplicate
- TCL - Target Compound List
- VOC - Volatile Organic Compounds
- SVOC - Semi-volatile Organic Compounds
- TA-NC - TestAmerica Laboratories, Inc. - North Canton, Ohio
- SDG - Sample Delivery Group

Table 2

**Validated Analytical Summary Results**  
**2017 Semi-Annual Monitoring**  
**Arkema East Plant - Halowax Area**  
**Wyandotte/Riverview, Michigan**  
**May 2017**

Location ID:	IRM-MW-1	IRM-MW-1	IRM-MW-2	MW010A
Sample Name:	GW-18224-050117-DC-001	GW-18224-050117-DC-002	GW-18224-050117-DC-005	GW-18224-050117-DC-003
Sample Date:	05/01/2017	05/01/2017	05/01/2017	05/01/2017
Depth:	--	--	--	--
		Duplicate		
Parameters	Unit			
<b>Volatile Organic Compounds</b>				
1,1,1-Trichloroethane	µg/L	33 U	25 U	8.0 U
1,1,2,2-Tetrachloroethane	µg/L	33 U	25 U	8.0 U
1,1,2-Trichloroethane	µg/L	33 U	25 U	8.0 U
1,1-Dichloroethane	µg/L	33 U	25 U	8.0 U
1,1-Dichloroethene	µg/L	33 U	25 U	8.0 U
1,2,4-Trichlorobenzene	µg/L	33 U	25 U	8.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	33 U	25 U	8.0 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	33 U	25 U	8.0 U
1,2-Dichlorobenzene	µg/L	33 U	30	8.0 U
1,2-Dichloroethane	µg/L	33 U	25 U	8.0 U
1,2-Dichloropropane	µg/L	33 U	25 U	8.0 U
1,3-Dichlorobenzene	µg/L	33 U	33	8.0 U
1,4-Dichlorobenzene	µg/L	33 U	170	8.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	330 U	250 U	80 U
2-Hexanone	µg/L	330 U	250 U	80 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	330 U	250 U	80 U
Acetone	µg/L	330 U	250 U	80 U
Benzene	µg/L	33 U	340	8.0 U
Bromodichloromethane	µg/L	33 U	25 U	8.0 U
Bromoform	µg/L	33 U	25 U	8.0 U
Bromomethane (Methyl bromide)	µg/L	33 U	25 U	8.0 U
Carbon disulfide	µg/L	170 U	170 U	40 U
Carbon tetrachloride	µg/L	33 U	25 U	8.0 U
Chlorobenzene	µg/L	33 U	660	8.0 U
Chloroethane	µg/L	33 U	25 U	8.0 U
Chloroform (Trichloromethane)	µg/L	920	25 U	8.0 U
Chloromethane (Methyl chloride)	µg/L	33 U	25 U	8.0 U
cis-1,2-Dichloroethene	µg/L	81	25 U	260
cis-1,3-Dichloropropene	µg/L	33 U	25 U	8.0 U
Cyclohexane	µg/L	33 U	25 U	8.0 U
Dibromochloromethane	µg/L	33 U	25 U	8.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	33 U	25 U	8.0 U
Ethylbenzene	µg/L	33 U	25 U	8.0 U
Isopropyl benzene	µg/L	33 U	25 U	8.0 U
Methyl acetate	µg/L	330 U	250 U	80 U

Table 2

**Validated Analytical Summary Results  
2017 Semi-Annual Monitoring  
Arkema East Plant - Halowax Area  
Wyandotte/Riverview, Michigan  
May 2017**

Location ID: Sample Name: Sample Date: Depth:	IRM-MW-1 GW-18224-050117-DC-001 05/01/2017	IRM-MW-1 GW-18224-050117-DC-002 05/01/2017	IRM-MW-2 GW-18224-050117-DC-005 05/01/2017	MW010A GW-18224-050117-DC-003 05/01/2017
-- <b>Duplicate</b>				
<b>Parameters</b>				
<b>Volatile Organic Compounds</b>				
Methyl cyclohexane	µg/L	33 U	33 U	25 U
Methyl tert butyl ether (MTBE)	µg/L	33 U	33 U	25 U
Methylene chloride	µg/L	170 U	170 U	130 U
Styrene	µg/L	33 U	33 U	25 U
Tetrachloroethene	µg/L	33 U	33 U	25 U
Toluene	µg/L	33 U	33 U	82
trans-1,2-Dichloroethene	µg/L	33 U	33 U	25 U
trans-1,3-Dichloropropene	µg/L	33 U	33 U	25 U
Trichloroethene	µg/L	33 U	33 U	25 U
Trichlorofluoromethane (CFC-11)	µg/L	33 U	33 U	25 U
Trifluorotrichloroethane (CFC-113)	µg/L	33 U	33 U	25 U
Vinyl chloride	µg/L	64	62	25 U
Xylenes (total)	µg/L	67 U	67 U	50 U
<b>Semivolatile Organic Compounds</b>				
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	µg/L	4.8 U	4.8 U	24 U
2,4,5-Trichlorophenol	µg/L	4.8 U	4.8 U	24 U
2,4,6-Trichlorophenol	µg/L	3.8 U	3.8 U	19 U
2,4-Dichlorophenol	µg/L	9.5 U	9.5 U	48 U
2,4-Dimethylphenol	µg/L	4.8 U	4.8 U	43
2,4-Dinitrophenol	µg/L	19 U	19 U	95 U
2,4-Dinitrotoluene	µg/L	4.8 U	4.8 U	24 U
2,6-Dinitrotoluene	µg/L	4.8 U	4.8 U	24 U
2-Chloronaphthalene	µg/L	4.8 U	4.8 U	91
2-Chlorophenol	µg/L	4.8 U	4.8 U	24 U
2-Methylnaphthalene	µg/L	4.8 U	4.8 U	24 U
2-Methylphenol	µg/L	4.8 U	4.8 U	24 U
2-Nitroaniline	µg/L	19 U	19 U	95 U
2-Nitrophenol	µg/L	4.8 U	4.8 U	24 U
384-Methylphenol	µg/L	4.8 U	4.8 U	24 U
3,3'-Dichlorobenzidine	µg/L	0.95 U	0.95 U	4.8 U
3-Nitroaniline	µg/L	19 U	19 U	95 U
4,6-Dinitro-2-methylphenol	µg/L	19 U	19 U	95 U
4-Bromophenyl phenyl ether	µg/L	4.8 U	4.8 U	24 U
4-Chloro-3-methylphenol	µg/L	4.8 U	4.8 U	24 U

Table 2

**Validated Analytical Summary Results  
2017 Semi-Annual Monitoring  
Arkema East Plant - Halowax Area  
Wyandotte/Riverview, Michigan  
May 2017**

Location ID:	IRM-MW-1	IRM-MW-1	IRM-MW-2	MW010A
Sample Name:	GW-18224-050117-DC-001	GW-18224-050117-DC-002	GW-18224-050117-DC-005	GW-18224-050117-DC-003
Sample Date:	05/01/2017	05/01/2017	05/01/2017	05/01/2017
Depth:	--	--	--	--
		Duplicate		
Parameters	Unit			
<b>Semivolatile Organic Compounds</b>				
4-Chloroaniline	µg/L	9.5 U	9.5 U	48 U
4-Chlorophenyl phenyl ether	µg/L	4.8 U	4.8 U	24 U
4-Nitroaniline	µg/L	19 U	19 U	95 U
4-Nitrophenol	µg/L	19 U	19 U	95 U
Acenaphthene	µg/L	4.8 U	4.8 U	24 U
Acenaphthylene	µg/L	4.8 U	4.8 U	24 U
Acetophenone	µg/L	4.8 U	4.8 U	24 U
Anthracene	µg/L	4.8 U	4.8 U	24 U
Atrazine	µg/L	2.9 U	2.9 U	14 U
Benzaldehyde	µg/L	4.8 U	4.8 U	24 U
Benzo(a)anthracene	µg/L	0.95 U	0.95 U	4.8 U
Benzo(a)pyrene	µg/L	0.95 U	0.95 U	4.8 U
Benzo(b)fluoranthene	µg/L	0.95 U	0.95 U	4.8 U
Benzo(g,h,i)perylene	µg/L	0.95 U	0.95 U	4.8 U
Benzo(k)fluoranthene	µg/L	0.95 U	0.95 U	4.8 U
Biphenyl (1,1-Biphenyl)	µg/L	4.8 U	4.8 U	24 U
bis(2-Chloroethoxy)methane	µg/L	4.8 U	4.8 U	24 U
bis(2-Chloroethyl)ether	µg/L	0.95 U	0.95 U	4.8 U
bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	4.8 U	4.8 U	24 U
Butyl benzylphthalate (BBP)	µg/L	4.8 U	4.8 U	24 U
Caprolactam	µg/L	9.5 U	9.5 U	48 U
Carbazole	µg/L	9.5 U	9.5 U	48 U
Chrysene	µg/L	0.95 U	0.95 U	4.8 U
Di-n-butylphthalate (DBP)	µg/L	4.8 U	4.8 U	24 U
Di-n-octyl phthalate (DnOP)	µg/L	4.8 U	4.8 U	24 U
Dibenz(a,h)anthracene	µg/L	1.9 U	1.9 U	9.5 U
Dibenzofuran	µg/L	3.8 U	3.8 U	19 U
Diethyl phthalate	µg/L	4.8 U	4.8 U	24 U
Dimethyl phthalate	µg/L	4.8 U	4.8 U	24 U
Fluoranthene	µg/L	0.95 U	0.95 U	4.8 U
Fluorene	µg/L	4.8 U	4.8 U	24 U
Hexachlorobenzene	µg/L	0.19 U	0.19 U	0.95 U
Hexachlorobutadiene	µg/L	0.95 U	0.95 U	4.8 U
Hexachlorocyclopentadiene	µg/L	4.8 U	4.8 U	24 U
Hexachloroethane	µg/L	4.8 U	4.8 U	24 U

Table 2

**Validated Analytical Summary Results  
2017 Semi-Annual Monitoring  
Arkema East Plant - Halowax Area  
Wyandotte/Riverview, Michigan  
May 2017**

Location ID:	IRM-MW-1	IRM-MW-1	IRM-MW-2	MW010A
Sample Name:	GW-18224-050117-DC-001	GW-18224-050117-DC-002	GW-18224-050117-DC-005	GW-18224-050117-DC-003
Sample Date:	05/01/2017	05/01/2017	05/01/2017	05/01/2017
Depth:	--	--	--	--
		Duplicate		
Parameters	Unit			
<b>Semivolatile Organic Compounds</b>				
Indeno(1,2,3-cd)pyrene	µg/L	1.9 U	1.9 U	9.5 U
Isophorone	µg/L	4.8 U	4.8 U	24 U
N-Nitrosodi-n-propylamine	µg/L	4.8 U	4.8 U	24 U
N-Nitrosodiphenylamine	µg/L	4.8 U	4.8 U	24 U
Naphthalene	µg/L	4.8 U	4.8 U	120
Nitrobenzene	µg/L	2.9 U	2.9 U	14 U
Pentachlorophenol	µg/L	4.8 U	4.8 U	24 U
Phenanthrene	µg/L	1.9 U	1.9 U	9.5 U
Phenol	µg/L	4.8 U	4.8 U	24 U
Pyrene	µg/L	4.8 U	4.8 U	24 U

Table 2

**Validated Analytical Summary Results  
2017 Semi-Annual Monitoring  
Arkema East Plant - Halowax Area  
Wyandotte/Riverview, Michigan  
May 2017**

Location ID:	MW016	MW025	Trip Blank
Sample Name:	GW-18224-050117-DC-006	GW-18224-050117-DC-004	TB-18224-050117
Sample Date:	05/01/2017	05/01/2017	05/01/2017
Depth:	--	--	--
<b>Parameters</b>			
<b>Volatile Organic Compounds</b>			
1,1,1-Trichloroethane	µg/L	3.3 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	3.3 U	1.0 U
1,1,2-Trichloroethane	µg/L	3.3 U	1.0 U
1,1-Dichloroethane	µg/L	3.3 U	1.0 U
1,1-Dichloroethene	µg/L	3.3 U	1.0 U
1,2,4-Trichlorobenzene	µg/L	3.3 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	3.3 U	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	µg/L	3.3 U	1.0 U
1,2-Dichlorobenzene	µg/L	3.3 U	3.1
1,2-Dichloroethane	µg/L	3.3 U	1.0 U
1,2-Dichloropropane	µg/L	3.3 U	1.0 U
1,3-Dichlorobenzene	µg/L	3.3 U	2.4
1,4-Dichlorobenzene	µg/L	3.3 U	7.7
2-Butanone (Methyl ethyl ketone) (MEK)	µg/L	33 U	10 U
2-Hexanone	µg/L	33 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/L	33 U	10 U
Acetone	µg/L	33 U	10 U
Benzene	µg/L	3.3 U	1.0 U
Bromodichloromethane	µg/L	3.3 U	1.0 U
Bromoform	µg/L	3.3 U	1.0 U
Bromomethane (Methyl bromide)	µg/L	3.3 U	1.0 U
Carbon disulfide	µg/L	17 U	5.0 U
Carbon tetrachloride	µg/L	3.3 U	1.0 U
Chlorobenzene	µg/L	3.3 U	35
Chloroethane	µg/L	57	1.0 U
Chloroform (Trichloromethane)	µg/L	3.3 U	1.0 U
Chloromethane (Methyl chloride)	µg/L	3.3 U	1.0 U
cis-1,2-Dichloroethene	µg/L	3.3 U	1.0 U
cis-1,3-Dichloropropene	µg/L	3.3 U	1.0 U
Cyclohexane	µg/L	3.3 U	1.0 U
Dibromochloromethane	µg/L	3.3 U	1.0 U
Dichlorodifluoromethane (CFC-12)	µg/L	3.3 U	1.0 U
Ethylbenzene	µg/L	3.3 U	1.0 U
Isopropyl benzene	µg/L	3.3 U	1.0 U
Methyl acetate	µg/L	33 U	10 U

Table 2

**Validated Analytical Summary Results  
2017 Semi-Annual Monitoring  
Arkema East Plant - Halowax Area  
Wyandotte/Riverview, Michigan  
May 2017**

Location ID:	MW016	MW025	Trip Blank
Sample Name:	GW-18224-050117-DC-006	GW-18224-050117-DC-004	TB-18224-050117
Sample Date:	05/01/2017	05/01/2017	05/01/2017
Depth:	--	--	--
<b>Parameters</b>			
<b>Volatile Organic Compounds</b>			
Methyl cyclohexane	µg/L	3.3 U	1.0 U
Methyl tert butyl ether (MTBE)	µg/L	3.3 U	1.0 U
Methylene chloride	µg/L	17 U	5.0 U
Styrene	µg/L	3.3 U	1.0 U
Tetrachloroethene	µg/L	3.3 U	1.0 U
Toluene	µg/L	3.3 U	1.0 U
trans-1,2-Dichloroethene	µg/L	3.3 U	1.0 U
trans-1,3-Dichloropropene	µg/L	3.3 U	1.0 U
Trichloroethene	µg/L	3.3 U	1.0 U
Trichlorofluoromethane (CFC-11)	µg/L	3.3 U	1.0 U
Trifluorotrichloroethane (CFC-113)	µg/L	3.3 U	1.0 U
Vinyl chloride	µg/L	3.3 U	1.0 U
Xylenes (total)	µg/L	6.7 U	2.0 U
<b>Semivolatile Organic Compounds</b>			
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	µg/L	5.0 U	4.8 U
2,4,5-Trichlorophenol	µg/L	5.0 U	4.8 U
2,4,6-Trichlorophenol	µg/L	4.0 U	3.8 U
2,4-Dichlorophenol	µg/L	10 U	9.5 U
2,4-Dimethylphenol	µg/L	5.0 U	4.8 U
2,4-Dinitrophenol	µg/L	20 U	19 U
2,4-Dinitrotoluene	µg/L	5.0 U	4.8 U
2,6-Dinitrotoluene	µg/L	5.0 U	4.8 U
2-Chloronaphthalene	µg/L	5.0 U	4.8 U
2-Chlorophenol	µg/L	5.0 U	4.8 U
2-Methylnaphthalene	µg/L	5.0 U	4.8 U
2-Methylphenol	µg/L	5.0 U	4.8 U
2-Nitroaniline	µg/L	20 U	19 U
2-Nitrophenol	µg/L	5.0 U	4.8 U
3&4-Methylphenol	µg/L	5.0 U	4.8 U
3,3'-Dichlorobenzidine	µg/L	1.0 U	0.95 U
3-Nitroaniline	µg/L	20 U	19 U
4,6-Dinitro-2-methylphenol	µg/L	20 U	19 U
4-Bromophenyl phenyl ether	µg/L	5.0 U	4.8 U
4-Chloro-3-methylphenol	µg/L	5.0 U	4.8 U

**Table 2**

**Validated Analytical Summary Results  
2017 Semi-Annual Monitoring  
Arkema East Plant - Halowax Area  
Wyandotte/Riverview, Michigan  
May 2017**

Location ID:	MW016	MW025	Trip Blank
Sample Name:	GW-18224-050117-DC-006	GW-18224-050117-DC-004	TB-18224-050117
Sample Date:	05/01/2017	05/01/2017	05/01/2017
Depth:	--	--	--

Parameters	Unit			
<b>Semivolatile Organic Compounds</b>				
4-Chloroaniline	µg/L	10 U	9.5 U	--
4-Chlorophenyl phenyl ether	µg/L	5.0 U	4.8 U	--
4-Nitroaniline	µg/L	20 U	19 U	--
4-Nitrophenol	µg/L	20 U	19 U	--
Acenaphthene	µg/L	5.0 U	4.8 U	--
Acenaphthylene	µg/L	5.0 U	4.8 U	--
Acetophenone	µg/L	5.0 U	4.8 U	--
Anthracene	µg/L	5.0 U	4.8 U	--
Atrazine	µg/L	3.0 U	2.9 U	--
Benzaldehyde	µg/L	5.0 U	4.8 U	--
Benzo(a)anthracene	µg/L	1.0 U	0.95 U	--
Benzo(a)pyrene	µg/L	1.0 U	0.95 U	--
Benzo(b)fluoranthene	µg/L	1.0 U	0.95 U	--
Benzo(g,h,i)perylene	µg/L	1.0 U	0.95 U	--
Benzo(k)fluoranthene	µg/L	1.0 U	0.95 U	--
Biphenyl (1,1-Biphenyl)	µg/L	5.0 U	4.8 U	--
bis(2-Chloroethoxy)methane	µg/L	5.0 U	4.8 U	--
bis(2-Chloroethyl)ether	µg/L	1.0 U	0.95 U	--
bis(2-Ethylhexyl)phthalate (DEHP)	µg/L	5.0 U	4.8 U	--
Butyl benzylphthalate (BBP)	µg/L	5.0 U	4.8 U	--
Caprolactam	µg/L	10 U	9.5 U	--
Carbazole	µg/L	10 U	9.5 U	--
Chrysene	µg/L	1.0 U	0.95 U	--
Di-n-butylphthalate (DBP)	µg/L	5.0 U	4.8 U	--
Di-n-octyl phthalate (DnOP)	µg/L	5.0 U	4.8 U	--
Dibenz(a,h)anthracene	µg/L	2.0 U	1.9 U	--
Dibenzofuran	µg/L	4.0 U	3.8 U	--
Diethyl phthalate	µg/L	5.0 U	4.8 U	--
Dimethyl phthalate	µg/L	5.0 U	4.8 U	--
Fluoranthene	µg/L	1.0 U	0.95 U	--
Fluorene	µg/L	5.0 U	4.8 U	--
Hexachlorobenzene	µg/L	0.20 U	0.19 U	--
Hexachlorobutadiene	µg/L	1.0 U	0.95 U	--
Hexachlorocyclopentadiene	µg/L	5.0 U	4.8 U	--
Hexachloroethane	µg/L	5.0 U	4.8 U	--

**Table 2**

**Validated Analytical Summary Results  
2017 Semi-Annual Monitoring  
Arkema East Plant - Halowax Area  
Wyandotte/Riverview, Michigan  
May 2017**

Location ID:	MW016	MW025	Trip Blank
Sample Name:	GW-18224-050117-DC-006	GW-18224-050117-DC-004	TB-18224-050117
Sample Date:	05/01/2017	05/01/2017	05/01/2017
Depth:	--	--	--
<b>Parameters</b>			
<b>Semivolatile Organic Compounds</b>			
Indeno(1,2,3-cd)pyrene	µg/L	2.0 U	1.9 U
Isophorone	µg/L	5.0 U	4.8 U
N-Nitrosodi-n-propylamine	µg/L	5.0 U	4.8 U
N-Nitrosodiphenylamine	µg/L	5.0 U	4.8 U
Naphthalene	µg/L	5.0 U	4.8 U
Nitrobenzene	µg/L	3.0 U	2.9 U
Pentachlorophenol	µg/L	5.0 U	4.8 U
Phenanthrene	µg/L	2.0 U	1.9 U
Phenol	µg/L	5.0 U	4.8 U
Pyrene	µg/L	5.0 U	4.8 U

Notes:

U - Not detected at the associated reporting limit

**Table 3**

**Analytical Methods  
2017 Semi-Annual Monitoring  
Arkema East Plant - Halowax Area  
Wyandotte/Riverview, Michigan  
May 2017**

<b>Parameter</b>	<b>Method</b>	<b>Matrix</b>	<b>Holding Time</b>	
			<b>Collection to Extraction (Days)</b>	<b>Collection or Extraction to Analysis (Days)</b>
TCL VOC	SW-846 8260B	Water	-	14
TCL SVOC	SW-846 8270C	Water	7	40

**Notes:****Method References:**

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions

TCL - Target Compound List

VOC - Volatile Organic Compounds

SVOC - Semi-volatile Organic Compounds

## **Attachment C**

# **Laboratory Analytical Reports**

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Canton

4101 Shuffel Street NW

North Canton, OH 44720

Tel: (330)497-9396

TestAmerica Job ID: 240-78922-1

Client Project/Site: 18224, Arkema Halowax Area

For:

GHD Services Inc.

6400 Shafer Court

Suite 400

Rosemont, Illinois 60018

Attn: Nancy Bergstrom

Denise Heckler

Authorized for release by:

5/12/2017 10:01:44 AM

Denise Heckler, Project Manager II

(330)966-9477

[denise.heckler@testamericainc.com](mailto:denise.heckler@testamericainc.com)

### LINKS

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Expert

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[www.testamericainc.com](http://www.testamericainc.com)

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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# Definitions/Glossary

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## Qualifiers

### GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
U	Indicates the analyte was analyzed for but not detected.
F2	MS/MSD RPD exceeds control limits
E	Result exceeded calibration range.

### GC/MS Semi VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

## Glossary

### Abbreviation

These commonly used abbreviations may or may not be present in this report.

□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: GHD Services Inc.  
Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## Job ID: 240-78922-1

### Laboratory: TestAmerica Canton

#### Narrative

#### Job Narrative 240-78922-1

#### Comments

No additional comments.

#### Receipt

The samples were received on 5/2/2017 11:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.1° C and 3.9° C.

#### GC/MS VOA

Method(s) 8260B: The laboratory control sample (LCS) for 278134 recovered outside control limits for multiple analytes. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Method(s) 8260B: The laboratory control sample (LCS) for 278328 recovered outside control limits for the following analytes: 1,1,1-Trichloroethane and/or Methyl tert-butyl ether. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### GC/MS Semi VOA

Method(s) 8270C: The low point of the Initial Calibration does not support the reporting limit for 3,3'-Dichlorobenzidine. The Method Detection Limits (MDL) for this analyte, though, is below the reporting limit.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### VOA Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

## Method Summary

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8270C	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CAN

**Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

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TestAmerica Canton

## Sample Summary

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-78922-1	GW-18224-050117-DC-001	Water	05/01/17 10:05	05/02/17 11:15
240-78922-2	GW-18224-050117-DC-002	Water	05/01/17 10:20	05/02/17 11:15
240-78922-3	GW-18224-050117-DC-003	Water	05/01/17 12:15	05/02/17 11:15
240-78922-4	GW-18224-050117-DC-004	Water	05/01/17 12:40	05/02/17 11:15
240-78922-5	GW-18224-050117-DC-005	Water	05/01/17 14:05	05/02/17 11:15
240-78922-6	GW-18224-050117-DC-006	Water	05/01/17 14:45	05/02/17 11:15
240-78922-7	TB-18224-050117	Water	05/01/17 00:00	05/02/17 11:15

# Detection Summary

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## Client Sample ID: GW-18224-050117-DC-001

## Lab Sample ID: 240-78922-1

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloroform	920		33	ug/L	33.33		8260B	Total/NA
Vinyl chloride	64		33	ug/L	33.33		8260B	Total/NA
cis-1,2-Dichloroethene	81		33	ug/L	33.33		8260B	Total/NA

## Client Sample ID: GW-18224-050117-DC-002

## Lab Sample ID: 240-78922-2

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloroform	870		33	ug/L	33.33		8260B	Total/NA
Vinyl chloride	62		33	ug/L	33.33		8260B	Total/NA
cis-1,2-Dichloroethene	81		33	ug/L	33.33		8260B	Total/NA

## Client Sample ID: GW-18224-050117-DC-003

## Lab Sample ID: 240-78922-3

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	19		8.0	ug/L	8		8260B	Total/NA
Vinyl chloride	99		8.0	ug/L	8		8260B	Total/NA
cis-1,2-Dichloroethene	260		8.0	ug/L	8		8260B	Total/NA
trans-1,2-Dichloroethene	42		8.0	ug/L	8		8260B	Total/NA

## Client Sample ID: GW-18224-050117-DC-004

## Lab Sample ID: 240-78922-4

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chlorobenzene	35		1.0	ug/L	1		8260B	Total/NA
1,2-Dichlorobenzene	3.1		1.0	ug/L	1		8260B	Total/NA
1,3-Dichlorobenzene	2.4		1.0	ug/L	1		8260B	Total/NA
1,4-Dichlorobenzene	7.7		1.0	ug/L	1		8260B	Total/NA

## Client Sample ID: GW-18224-050117-DC-005

## Lab Sample ID: 240-78922-5

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Benzene	340		25	ug/L	25		8260B	Total/NA
Chlorobenzene	660		25	ug/L	25		8260B	Total/NA
Toluene	82		25	ug/L	25		8260B	Total/NA
1,2-Dichlorobenzene	30		25	ug/L	25		8260B	Total/NA
1,3-Dichlorobenzene	33		25	ug/L	25		8260B	Total/NA
1,4-Dichlorobenzene	170		25	ug/L	25		8260B	Total/NA
2,4-Dimethylphenol	43		24	ug/L	5		8270C	Total/NA
2-Chloronaphthalene	91		24	ug/L	5		8270C	Total/NA
Naphthalene	120		24	ug/L	5		8270C	Total/NA

## Client Sample ID: GW-18224-050117-DC-006

## Lab Sample ID: 240-78922-6

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloroethane	57		3.3	ug/L	3.33		8260B	Total/NA

## Client Sample ID: TB-18224-050117

## Lab Sample ID: 240-78922-7

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

# Client Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: GW-18224-050117-DC-001**

Date Collected: 05/01/17 10:05

Date Received: 05/02/17 11:15

**Lab Sample ID: 240-78922-1**

Matrix: Water

**Method: 8260B - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	330	U	330	ug/L			05/09/17 13:35	33.33
Benzene	33	U	33	ug/L			05/09/17 13:35	33.33
Bromodichloromethane	33	U	33	ug/L			05/09/17 13:35	33.33
Bromoform	33	U	33	ug/L			05/09/17 13:35	33.33
Bromomethane	33	U	33	ug/L			05/09/17 13:35	33.33
2-Butanone (MEK)	330	U	330	ug/L			05/09/17 13:35	33.33
Carbon disulfide	170	U	170	ug/L			05/09/17 13:35	33.33
Carbon tetrachloride	33	U	33	ug/L			05/09/17 13:35	33.33
Chlorobenzene	33	U	33	ug/L			05/09/17 13:35	33.33
Chloroethane	33	U	33	ug/L			05/09/17 13:35	33.33
<b>Chloroform</b>	<b>920</b>		33	ug/L			05/09/17 13:35	33.33
Chloromethane	33	U	33	ug/L			05/09/17 13:35	33.33
1,1-Dichloroethane	33	U	33	ug/L			05/09/17 13:35	33.33
1,2-Dichloroethane	33	U	33	ug/L			05/09/17 13:35	33.33
1,1-Dichloroethene	33	U	33	ug/L			05/09/17 13:35	33.33
1,2-Dichloropropane	33	U	33	ug/L			05/09/17 13:35	33.33
cis-1,3-Dichloropropene	33	U	33	ug/L			05/09/17 13:35	33.33
trans-1,3-Dichloropropene	33	U	33	ug/L			05/09/17 13:35	33.33
Ethylbenzene	33	U	33	ug/L			05/09/17 13:35	33.33
2-Hexanone	330	U	330	ug/L			05/09/17 13:35	33.33
Methylene Chloride	170	U	170	ug/L			05/09/17 13:35	33.33
4-Methyl-2-pentanone (MIBK)	330	U	330	ug/L			05/09/17 13:35	33.33
Styrene	33	U	33	ug/L			05/09/17 13:35	33.33
1,1,2,2-Tetrachloroethane	33	U	33	ug/L			05/09/17 13:35	33.33
Tetrachloroethene	33	U	33	ug/L			05/09/17 13:35	33.33
Toluene	33	U	33	ug/L			05/09/17 13:35	33.33
Trichloroethene	33	U	33	ug/L			05/09/17 13:35	33.33
<b>Vinyl chloride</b>	<b>64</b>		33	ug/L			05/09/17 13:35	33.33
Xylenes, Total	67	U	67	ug/L			05/09/17 13:35	33.33
1,1,1-Trichloroethane	33	U *	33	ug/L			05/09/17 13:35	33.33
1,1,2-Trichloroethane	33	U	33	ug/L			05/09/17 13:35	33.33
Cyclohexane	33	U	33	ug/L			05/09/17 13:35	33.33
1,2-Dibromo-3-Chloropropane	33	U	33	ug/L			05/09/17 13:35	33.33
1,2-Dibromoethane	33	U	33	ug/L			05/09/17 13:35	33.33
Dichlorodifluoromethane	33	U	33	ug/L			05/09/17 13:35	33.33
<b>cis-1,2-Dichloroethene</b>	<b>81</b>		33	ug/L			05/09/17 13:35	33.33
trans-1,2-Dichloroethene	33	U	33	ug/L			05/09/17 13:35	33.33
Isopropylbenzene	33	U	33	ug/L			05/09/17 13:35	33.33
Methyl acetate	330	U	330	ug/L			05/09/17 13:35	33.33
Methyl tert-butyl ether	33	U *	33	ug/L			05/09/17 13:35	33.33
1,1,2-Trichloro-1,2,2-trifluoroethane	33	U	33	ug/L			05/09/17 13:35	33.33
1,2,4-Trichlorobenzene	33	U	33	ug/L			05/09/17 13:35	33.33
1,2-Dichlorobenzene	33	U	33	ug/L			05/09/17 13:35	33.33
1,3-Dichlorobenzene	33	U	33	ug/L			05/09/17 13:35	33.33
1,4-Dichlorobenzene	33	U	33	ug/L			05/09/17 13:35	33.33
Trichlorofluoromethane	33	U *	33	ug/L			05/09/17 13:35	33.33
Dibromochloromethane	33	U	33	ug/L			05/09/17 13:35	33.33
Methylcyclohexane	33	U	33	ug/L			05/09/17 13:35	33.33

TestAmerica Canton

# Client Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: GW-18224-050117-DC-001**

**Date Collected: 05/01/17 10:05**

**Date Received: 05/02/17 11:15**

**Lab Sample ID: 240-78922-1**

**Matrix: Water**

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	116		61 - 138		05/09/17 13:35	33.33
4-Bromofluorobenzene (Surr)	96		69 - 120		05/09/17 13:35	33.33
Toluene-d8 (Surr)	100		73 - 120		05/09/17 13:35	33.33
Dibromofluoromethane (Surr)	120		69 - 124		05/09/17 13:35	33.33

## Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
2,2'-oxybis[1-chloropropane]	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
2,4,5-Trichlorophenol	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
2,4,6-Trichlorophenol	3.8	U	3.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
2,4-Dichlorophenol	9.5	U	9.5	ug/L	05/04/17 08:36	05/08/17 10:20		1
2,4-Dimethylphenol	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
2,4-Dinitrophenol	19	U	19	ug/L	05/04/17 08:36	05/08/17 10:20		1
2,4-Dinitrotoluene	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
2,6-Dinitrotoluene	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
2-Chloronaphthalene	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
2-Chlorophenol	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
2-Methylnaphthalene	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
2-Methylphenol	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
2-Nitroaniline	19	U	19	ug/L	05/04/17 08:36	05/08/17 10:20		1
2-Nitrophenol	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
3,3'-Dichlorobenzidine	0.95	U	0.95	ug/L	05/04/17 08:36	05/08/17 10:20		1
3-Nitroaniline	19	U	19	ug/L	05/04/17 08:36	05/08/17 10:20		1
4,6-Dinitro-2-methylphenol	19	U	19	ug/L	05/04/17 08:36	05/08/17 10:20		1
4-Bromophenyl phenyl ether	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
4-Chloro-3-methylphenol	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
4-Chloroaniline	9.5	U	9.5	ug/L	05/04/17 08:36	05/08/17 10:20		1
4-Chlorophenyl phenyl ether	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
4-Nitroaniline	19	U	19	ug/L	05/04/17 08:36	05/08/17 10:20		1
4-Nitrophenol	19	U	19	ug/L	05/04/17 08:36	05/08/17 10:20		1
Acenaphthene	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
Acenaphthylene	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
Acetophenone	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
Anthracene	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
Atrazine	2.9	U	2.9	ug/L	05/04/17 08:36	05/08/17 10:20		1
Benzaldehyde	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
Benzo[a]anthracene	0.95	U	0.95	ug/L	05/04/17 08:36	05/08/17 10:20		1
Benzo[a]pyrene	0.95	U	0.95	ug/L	05/04/17 08:36	05/08/17 10:20		1
Benzo[b]fluoranthene	0.95	U	0.95	ug/L	05/04/17 08:36	05/08/17 10:20		1
Benzo[g,h,i]perylene	0.95	U	0.95	ug/L	05/04/17 08:36	05/08/17 10:20		1
Benzo[k]fluoranthene	0.95	U	0.95	ug/L	05/04/17 08:36	05/08/17 10:20		1
Bis(2-chloroethoxy)methane	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
Bis(2-chloroethyl)ether	0.95	U	0.95	ug/L	05/04/17 08:36	05/08/17 10:20		1
Bis(2-ethylhexyl) phthalate	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
Butyl benzyl phthalate	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:20		1
Caprolactam	9.5	U	9.5	ug/L	05/04/17 08:36	05/08/17 10:20		1
Carbazole	9.5	U	9.5	ug/L	05/04/17 08:36	05/08/17 10:20		1
Chrysene	0.95	U	0.95	ug/L	05/04/17 08:36	05/08/17 10:20		1
Dibenzo(a,h)anthracene	1.9	U	1.9	ug/L	05/04/17 08:36	05/08/17 10:20		1

TestAmerica Canton

# Client Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: GW-18224-050117-DC-001**

**Lab Sample ID: 240-78922-1**

**Matrix: Water**

Date Collected: 05/01/17 10:05

Date Received: 05/02/17 11:15

## Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenzofuran	3.8	U	3.8	ug/L		05/04/17 08:36	05/08/17 10:20	1
Diethyl phthalate	4.8	U	4.8	ug/L		05/04/17 08:36	05/08/17 10:20	1
Dimethyl phthalate	4.8	U	4.8	ug/L		05/04/17 08:36	05/08/17 10:20	1
Di-n-butyl phthalate	4.8	U	4.8	ug/L		05/04/17 08:36	05/08/17 10:20	1
Di-n-octyl phthalate	4.8	U	4.8	ug/L		05/04/17 08:36	05/08/17 10:20	1
Fluoranthene	0.95	U	0.95	ug/L		05/04/17 08:36	05/08/17 10:20	1
Fluorene	4.8	U	4.8	ug/L		05/04/17 08:36	05/08/17 10:20	1
Hexachlorobenzene	0.19	U	0.19	ug/L		05/04/17 08:36	05/08/17 10:20	1
Hexachlorobutadiene	0.95	U	0.95	ug/L		05/04/17 08:36	05/08/17 10:20	1
Hexachlorocyclopentadiene	4.8	U	4.8	ug/L		05/04/17 08:36	05/08/17 10:20	1
Hexachloroethane	4.8	U	4.8	ug/L		05/04/17 08:36	05/08/17 10:20	1
Indeno[1,2,3-cd]pyrene	1.9	U	1.9	ug/L		05/04/17 08:36	05/08/17 10:20	1
Isophorone	4.8	U	4.8	ug/L		05/04/17 08:36	05/08/17 10:20	1
Naphthalene	4.8	U	4.8	ug/L		05/04/17 08:36	05/08/17 10:20	1
Nitrobenzene	2.9	U	2.9	ug/L		05/04/17 08:36	05/08/17 10:20	1
N-Nitrosodi-n-propylamine	4.8	U	4.8	ug/L		05/04/17 08:36	05/08/17 10:20	1
N-Nitrosodiphenylamine	4.8	U	4.8	ug/L		05/04/17 08:36	05/08/17 10:20	1
Pentachlorophenol	4.8	U	4.8	ug/L		05/04/17 08:36	05/08/17 10:20	1
Phenol	4.8	U	4.8	ug/L		05/04/17 08:36	05/08/17 10:20	1
Phenanthrene	1.9	U	1.9	ug/L		05/04/17 08:36	05/08/17 10:20	1
Pyrene	4.8	U	4.8	ug/L		05/04/17 08:36	05/08/17 10:20	1
3 & 4 Methylphenol	4.8	U	4.8	ug/L		05/04/17 08:36	05/08/17 10:20	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	78		42 - 120		05/04/17 08:36	05/08/17 10:20
2-Fluorophenol (Surr)	41		10 - 120		05/04/17 08:36	05/08/17 10:20
2,4,6-Tribromophenol (Surr)	74		35 - 125		05/04/17 08:36	05/08/17 10:20
Nitrobenzene-d5 (Surr)	78		36 - 120		05/04/17 08:36	05/08/17 10:20
Phenol-d5 (Surr)	25		10 - 120		05/04/17 08:36	05/08/17 10:20
Terphenyl-d14 (Surr)	74		17 - 120		05/04/17 08:36	05/08/17 10:20

# Client Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: GW-18224-050117-DC-002**

Date Collected: 05/01/17 10:20

Date Received: 05/02/17 11:15

**Lab Sample ID: 240-78922-2**

Matrix: Water

**Method: 8260B - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	330	U	330	ug/L			05/09/17 13:58	33.33
Benzene	33	U	33	ug/L			05/09/17 13:58	33.33
Bromodichloromethane	33	U	33	ug/L			05/09/17 13:58	33.33
Bromoform	33	U	33	ug/L			05/09/17 13:58	33.33
Bromomethane	33	U	33	ug/L			05/09/17 13:58	33.33
2-Butanone (MEK)	330	U	330	ug/L			05/09/17 13:58	33.33
Carbon disulfide	170	U	170	ug/L			05/09/17 13:58	33.33
Carbon tetrachloride	33	U	33	ug/L			05/09/17 13:58	33.33
Chlorobenzene	33	U	33	ug/L			05/09/17 13:58	33.33
Chloroethane	33	U	33	ug/L			05/09/17 13:58	33.33
<b>Chloroform</b>	<b>870</b>		33	ug/L			05/09/17 13:58	33.33
Chloromethane	33	U	33	ug/L			05/09/17 13:58	33.33
1,1-Dichloroethane	33	U	33	ug/L			05/09/17 13:58	33.33
1,2-Dichloroethane	33	U	33	ug/L			05/09/17 13:58	33.33
1,1-Dichloroethene	33	U	33	ug/L			05/09/17 13:58	33.33
1,2-Dichloropropane	33	U	33	ug/L			05/09/17 13:58	33.33
cis-1,3-Dichloropropene	33	U	33	ug/L			05/09/17 13:58	33.33
trans-1,3-Dichloropropene	33	U	33	ug/L			05/09/17 13:58	33.33
Ethylbenzene	33	U	33	ug/L			05/09/17 13:58	33.33
2-Hexanone	330	U	330	ug/L			05/09/17 13:58	33.33
Methylene Chloride	170	U	170	ug/L			05/09/17 13:58	33.33
4-Methyl-2-pentanone (MIBK)	330	U	330	ug/L			05/09/17 13:58	33.33
Styrene	33	U	33	ug/L			05/09/17 13:58	33.33
1,1,2,2-Tetrachloroethane	33	U	33	ug/L			05/09/17 13:58	33.33
Tetrachloroethene	33	U	33	ug/L			05/09/17 13:58	33.33
Toluene	33	U	33	ug/L			05/09/17 13:58	33.33
Trichloroethene	33	U	33	ug/L			05/09/17 13:58	33.33
<b>Vinyl chloride</b>	<b>62</b>		33	ug/L			05/09/17 13:58	33.33
Xylenes, Total	67	U	67	ug/L			05/09/17 13:58	33.33
1,1,1-Trichloroethane	33	U *	33	ug/L			05/09/17 13:58	33.33
1,1,2-Trichloroethane	33	U	33	ug/L			05/09/17 13:58	33.33
Cyclohexane	33	U	33	ug/L			05/09/17 13:58	33.33
1,2-Dibromo-3-Chloropropane	33	U	33	ug/L			05/09/17 13:58	33.33
1,2-Dibromoethane	33	U	33	ug/L			05/09/17 13:58	33.33
Dichlorodifluoromethane	33	U	33	ug/L			05/09/17 13:58	33.33
<b>cis-1,2-Dichloroethene</b>	<b>81</b>		33	ug/L			05/09/17 13:58	33.33
trans-1,2-Dichloroethene	33	U	33	ug/L			05/09/17 13:58	33.33
Isopropylbenzene	33	U	33	ug/L			05/09/17 13:58	33.33
Methyl acetate	330	U	330	ug/L			05/09/17 13:58	33.33
Methyl tert-butyl ether	33	U *	33	ug/L			05/09/17 13:58	33.33
1,1,2-Trichloro-1,2,2-trifluoroethane	33	U	33	ug/L			05/09/17 13:58	33.33
1,2,4-Trichlorobenzene	33	U	33	ug/L			05/09/17 13:58	33.33
1,2-Dichlorobenzene	33	U	33	ug/L			05/09/17 13:58	33.33
1,3-Dichlorobenzene	33	U	33	ug/L			05/09/17 13:58	33.33
1,4-Dichlorobenzene	33	U	33	ug/L			05/09/17 13:58	33.33
Trichlorofluoromethane	33	U *	33	ug/L			05/09/17 13:58	33.33
Dibromochloromethane	33	U	33	ug/L			05/09/17 13:58	33.33
Methylcyclohexane	33	U	33	ug/L			05/09/17 13:58	33.33

TestAmerica Canton

# Client Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: GW-18224-050117-DC-002**

**Date Collected: 05/01/17 10:20**

**Date Received: 05/02/17 11:15**

**Lab Sample ID: 240-78922-2**

**Matrix: Water**

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	115		61 - 138		05/09/17 13:58	33.33
4-Bromofluorobenzene (Surr)	89		69 - 120		05/09/17 13:58	33.33
Toluene-d8 (Surr)	98		73 - 120		05/09/17 13:58	33.33
Dibromofluoromethane (Surr)	116		69 - 124		05/09/17 13:58	33.33

## Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
2,2'-oxybis[1-chloropropane]	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
2,4,5-Trichlorophenol	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
2,4,6-Trichlorophenol	3.8	U	3.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
2,4-Dichlorophenol	9.5	U	9.5	ug/L	05/04/17 08:36	05/08/17 10:44		1
2,4-Dimethylphenol	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
2,4-Dinitrophenol	19	U	19	ug/L	05/04/17 08:36	05/08/17 10:44		1
2,4-Dinitrotoluene	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
2,6-Dinitrotoluene	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
2-Chloronaphthalene	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
2-Chlorophenol	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
2-Methylnaphthalene	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
2-Methylphenol	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
2-Nitroaniline	19	U	19	ug/L	05/04/17 08:36	05/08/17 10:44		1
2-Nitrophenol	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
3,3'-Dichlorobenzidine	0.95	U	0.95	ug/L	05/04/17 08:36	05/08/17 10:44		1
3-Nitroaniline	19	U	19	ug/L	05/04/17 08:36	05/08/17 10:44		1
4,6-Dinitro-2-methylphenol	19	U	19	ug/L	05/04/17 08:36	05/08/17 10:44		1
4-Bromophenyl phenyl ether	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
4-Chloro-3-methylphenol	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
4-Chloroaniline	9.5	U	9.5	ug/L	05/04/17 08:36	05/08/17 10:44		1
4-Chlorophenyl phenyl ether	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
4-Nitroaniline	19	U	19	ug/L	05/04/17 08:36	05/08/17 10:44		1
4-Nitrophenol	19	U	19	ug/L	05/04/17 08:36	05/08/17 10:44		1
Acenaphthene	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
Acenaphthylene	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
Acetophenone	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
Anthracene	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
Atrazine	2.9	U	2.9	ug/L	05/04/17 08:36	05/08/17 10:44		1
Benzaldehyde	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
Benzo[a]anthracene	0.95	U	0.95	ug/L	05/04/17 08:36	05/08/17 10:44		1
Benzo[a]pyrene	0.95	U	0.95	ug/L	05/04/17 08:36	05/08/17 10:44		1
Benzo[b]fluoranthene	0.95	U	0.95	ug/L	05/04/17 08:36	05/08/17 10:44		1
Benzo[g,h,i]perylene	0.95	U	0.95	ug/L	05/04/17 08:36	05/08/17 10:44		1
Benzo[k]fluoranthene	0.95	U	0.95	ug/L	05/04/17 08:36	05/08/17 10:44		1
Bis(2-chloroethoxy)methane	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
Bis(2-chloroethyl)ether	0.95	U	0.95	ug/L	05/04/17 08:36	05/08/17 10:44		1
Bis(2-ethylhexyl) phthalate	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
Butyl benzyl phthalate	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
Caprolactam	9.5	U	9.5	ug/L	05/04/17 08:36	05/08/17 10:44		1
Carbazole	9.5	U	9.5	ug/L	05/04/17 08:36	05/08/17 10:44		1
Chrysene	0.95	U	0.95	ug/L	05/04/17 08:36	05/08/17 10:44		1
Dibenzo(a,h)anthracene	1.9	U	1.9	ug/L	05/04/17 08:36	05/08/17 10:44		1

TestAmerica Canton

# Client Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: GW-18224-050117-DC-002**

**Date Collected: 05/01/17 10:20**

**Date Received: 05/02/17 11:15**

**Lab Sample ID: 240-78922-2**

**Matrix: Water**

**Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenzofuran	3.8	U	3.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
Diethyl phthalate	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
Dimethyl phthalate	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
Di-n-butyl phthalate	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
Di-n-octyl phthalate	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
Fluoranthene	0.95	U	0.95	ug/L	05/04/17 08:36	05/08/17 10:44		1
Fluorene	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
Hexachlorobenzene	0.19	U	0.19	ug/L	05/04/17 08:36	05/08/17 10:44		1
Hexachlorobutadiene	0.95	U	0.95	ug/L	05/04/17 08:36	05/08/17 10:44		1
Hexachlorocyclopentadiene	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
Hexachloroethane	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
Indeno[1,2,3-cd]pyrene	1.9	U	1.9	ug/L	05/04/17 08:36	05/08/17 10:44		1
Isophorone	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
Naphthalene	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
Nitrobenzene	2.9	U	2.9	ug/L	05/04/17 08:36	05/08/17 10:44		1
N-Nitrosodi-n-propylamine	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
N-Nitrosodiphenylamine	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
Pentachlorophenol	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
Phenol	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
Phenanthrene	1.9	U	1.9	ug/L	05/04/17 08:36	05/08/17 10:44		1
Pyrene	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1
3 & 4 Methylphenol	4.8	U	4.8	ug/L	05/04/17 08:36	05/08/17 10:44		1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	70		42 - 120	05/04/17 08:36	05/08/17 10:44	1
2-Fluorophenol (Surr)	34		10 - 120	05/04/17 08:36	05/08/17 10:44	1
2,4,6-Tribromophenol (Surr)	69		35 - 125	05/04/17 08:36	05/08/17 10:44	1
Nitrobenzene-d5 (Surr)	68		36 - 120	05/04/17 08:36	05/08/17 10:44	1
Phenol-d5 (Surr)	20		10 - 120	05/04/17 08:36	05/08/17 10:44	1
Terphenyl-d14 (Surr)	67		17 - 120	05/04/17 08:36	05/08/17 10:44	1

# Client Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: GW-18224-050117-DC-003**

Date Collected: 05/01/17 12:15

Date Received: 05/02/17 11:15

**Lab Sample ID: 240-78922-3**

Matrix: Water

**Method: 8260B - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	80	U	80	ug/L			05/09/17 14:20	8
Benzene	8.0	U	8.0	ug/L			05/09/17 14:20	8
Bromodichloromethane	8.0	U	8.0	ug/L			05/09/17 14:20	8
Bromoform	8.0	U	8.0	ug/L			05/09/17 14:20	8
Bromomethane	8.0	U	8.0	ug/L			05/09/17 14:20	8
2-Butanone (MEK)	80	U	80	ug/L			05/09/17 14:20	8
Carbon disulfide	40	U	40	ug/L			05/09/17 14:20	8
Carbon tetrachloride	8.0	U	8.0	ug/L			05/09/17 14:20	8
Chlorobenzene	8.0	U	8.0	ug/L			05/09/17 14:20	8
Chloroethane	8.0	U	8.0	ug/L			05/09/17 14:20	8
Chloroform	8.0	U	8.0	ug/L			05/09/17 14:20	8
Chloromethane	8.0	U	8.0	ug/L			05/09/17 14:20	8
1,1-Dichloroethane	8.0	U	8.0	ug/L			05/09/17 14:20	8
1,2-Dichloroethane	8.0	U	8.0	ug/L			05/09/17 14:20	8
1,1-Dichloroethene	8.0	U	8.0	ug/L			05/09/17 14:20	8
1,2-Dichloropropane	8.0	U	8.0	ug/L			05/09/17 14:20	8
cis-1,3-Dichloropropene	8.0	U	8.0	ug/L			05/09/17 14:20	8
trans-1,3-Dichloropropene	8.0	U	8.0	ug/L			05/09/17 14:20	8
Ethylbenzene	8.0	U	8.0	ug/L			05/09/17 14:20	8
2-Hexanone	80	U	80	ug/L			05/09/17 14:20	8
Methylene Chloride	40	U	40	ug/L			05/09/17 14:20	8
4-Methyl-2-pentanone (MIBK)	80	U	80	ug/L			05/09/17 14:20	8
Styrene	8.0	U	8.0	ug/L			05/09/17 14:20	8
1,1,2,2-Tetrachloroethane	8.0	U	8.0	ug/L			05/09/17 14:20	8
Tetrachloroethene	8.0	U	8.0	ug/L			05/09/17 14:20	8
Toluene	8.0	U	8.0	ug/L			05/09/17 14:20	8
<b>Trichloroethene</b>	<b>19</b>		8.0	ug/L			05/09/17 14:20	8
<b>Vinyl chloride</b>	<b>99</b>		8.0	ug/L			05/09/17 14:20	8
Xylenes, Total	16	U	16	ug/L			05/09/17 14:20	8
1,1,1-Trichloroethane	8.0	U *	8.0	ug/L			05/09/17 14:20	8
1,1,2-Trichloroethane	8.0	U	8.0	ug/L			05/09/17 14:20	8
Cyclohexane	8.0	U	8.0	ug/L			05/09/17 14:20	8
1,2-Dibromo-3-Chloropropane	8.0	U	8.0	ug/L			05/09/17 14:20	8
1,2-Dibromoethane	8.0	U	8.0	ug/L			05/09/17 14:20	8
Dichlorodifluoromethane	8.0	U	8.0	ug/L			05/09/17 14:20	8
<b>cis-1,2-Dichloroethene</b>	<b>260</b>		8.0	ug/L			05/09/17 14:20	8
<b>trans-1,2-Dichloroethene</b>	<b>42</b>		8.0	ug/L			05/09/17 14:20	8
Isopropylbenzene	8.0	U	8.0	ug/L			05/09/17 14:20	8
Methyl acetate	80	U	80	ug/L			05/09/17 14:20	8
Methyl tert-butyl ether	8.0	U *	8.0	ug/L			05/09/17 14:20	8
1,1,2-Trichloro-1,2,2-trifluoroethane	8.0	U	8.0	ug/L			05/09/17 14:20	8
1,2,4-Trichlorobenzene	8.0	U F2	8.0	ug/L			05/09/17 14:20	8
1,2-Dichlorobenzene	8.0	U	8.0	ug/L			05/09/17 14:20	8
1,3-Dichlorobenzene	8.0	U	8.0	ug/L			05/09/17 14:20	8
1,4-Dichlorobenzene	8.0	U	8.0	ug/L			05/09/17 14:20	8
Trichlorofluoromethane	8.0	U *	8.0	ug/L			05/09/17 14:20	8
Dibromochloromethane	8.0	U	8.0	ug/L			05/09/17 14:20	8
Methylcyclohexane	8.0	U	8.0	ug/L			05/09/17 14:20	8

TestAmerica Canton

# Client Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: GW-18224-050117-DC-003**

**Date Collected: 05/01/17 12:15**

**Date Received: 05/02/17 11:15**

**Lab Sample ID: 240-78922-3**

**Matrix: Water**

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	111		61 - 138		05/09/17 14:20	8
4-Bromofluorobenzene (Surr)	90		69 - 120		05/09/17 14:20	8
Toluene-d8 (Surr)	97		73 - 120		05/09/17 14:20	8
Dibromofluoromethane (Surr)	116		69 - 124		05/09/17 14:20	8

## Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
2,2'-oxybis[1-chloropropane]	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
2,4,5-Trichlorophenol	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
2,4,6-Trichlorophenol	4.3	U	4.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
2,4-Dichlorophenol	11	U	11	ug/L	05/04/17 08:36	05/08/17 07:57		1
2,4-Dimethylphenol	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
2,4-Dinitrophenol	21	U	21	ug/L	05/04/17 08:36	05/08/17 07:57		1
2,4-Dinitrotoluene	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
2,6-Dinitrotoluene	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
2-Chloronaphthalene	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
2-Chlorophenol	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
2-Methylnaphthalene	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
2-Methylphenol	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
2-Nitroaniline	21	U	21	ug/L	05/04/17 08:36	05/08/17 07:57		1
2-Nitrophenol	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
3,3'-Dichlorobenzidine	1.1	U	1.1	ug/L	05/04/17 08:36	05/08/17 07:57		1
3-Nitroaniline	21	U	21	ug/L	05/04/17 08:36	05/08/17 07:57		1
4,6-Dinitro-2-methylphenol	21	U	21	ug/L	05/04/17 08:36	05/08/17 07:57		1
4-Bromophenyl phenyl ether	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
4-Chloro-3-methylphenol	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
4-Chloroaniline	11	U	11	ug/L	05/04/17 08:36	05/08/17 07:57		1
4-Chlorophenyl phenyl ether	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
4-Nitroaniline	21	U	21	ug/L	05/04/17 08:36	05/08/17 07:57		1
4-Nitrophenol	21	U	21	ug/L	05/04/17 08:36	05/08/17 07:57		1
Acenaphthene	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
Acenaphthylene	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
Acetophenone	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
Anthracene	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
Atrazine	3.2	U	3.2	ug/L	05/04/17 08:36	05/08/17 07:57		1
Benzaldehyde	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
Benzo[a]anthracene	1.1	U	1.1	ug/L	05/04/17 08:36	05/08/17 07:57		1
Benzo[a]pyrene	1.1	U	1.1	ug/L	05/04/17 08:36	05/08/17 07:57		1
Benzo[b]fluoranthene	1.1	U	1.1	ug/L	05/04/17 08:36	05/08/17 07:57		1
Benzo[g,h,i]perylene	1.1	U	1.1	ug/L	05/04/17 08:36	05/08/17 07:57		1
Benzo[k]fluoranthene	1.1	U	1.1	ug/L	05/04/17 08:36	05/08/17 07:57		1
Bis(2-chloroethoxy)methane	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
Bis(2-chloroethyl)ether	1.1	U	1.1	ug/L	05/04/17 08:36	05/08/17 07:57		1
Bis(2-ethylhexyl) phthalate	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
Butyl benzyl phthalate	5.3	U	5.3	ug/L	05/04/17 08:36	05/08/17 07:57		1
Caprolactam	11	U	11	ug/L	05/04/17 08:36	05/08/17 07:57		1
Carbazole	11	U	11	ug/L	05/04/17 08:36	05/08/17 07:57		1
Chrysene	1.1	U	1.1	ug/L	05/04/17 08:36	05/08/17 07:57		1
Dibenzo(a,h)anthracene	2.1	U	2.1	ug/L	05/04/17 08:36	05/08/17 07:57		1

TestAmerica Canton

# Client Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: GW-18224-050117-DC-003**

**Lab Sample ID: 240-78922-3**

**Matrix: Water**

Date Collected: 05/01/17 12:15

Date Received: 05/02/17 11:15

## Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenzofuran	4.3	U	4.3	ug/L		05/04/17 08:36	05/08/17 07:57	1
Diethyl phthalate	5.3	U	5.3	ug/L		05/04/17 08:36	05/08/17 07:57	1
Dimethyl phthalate	5.3	U	5.3	ug/L		05/04/17 08:36	05/08/17 07:57	1
Di-n-butyl phthalate	5.3	U	5.3	ug/L		05/04/17 08:36	05/08/17 07:57	1
Di-n-octyl phthalate	5.3	U	5.3	ug/L		05/04/17 08:36	05/08/17 07:57	1
Fluoranthene	1.1	U	1.1	ug/L		05/04/17 08:36	05/08/17 07:57	1
Fluorene	5.3	U	5.3	ug/L		05/04/17 08:36	05/08/17 07:57	1
Hexachlorobenzene	0.21	U	0.21	ug/L		05/04/17 08:36	05/08/17 07:57	1
Hexachlorobutadiene	1.1	U	1.1	ug/L		05/04/17 08:36	05/08/17 07:57	1
Hexachlorocyclopentadiene	5.3	U	5.3	ug/L		05/04/17 08:36	05/08/17 07:57	1
Hexachloroethane	5.3	U	5.3	ug/L		05/04/17 08:36	05/08/17 07:57	1
Indeno[1,2,3-cd]pyrene	2.1	U	2.1	ug/L		05/04/17 08:36	05/08/17 07:57	1
Isophorone	5.3	U	5.3	ug/L		05/04/17 08:36	05/08/17 07:57	1
Naphthalene	5.3	U	5.3	ug/L		05/04/17 08:36	05/08/17 07:57	1
Nitrobenzene	3.2	U	3.2	ug/L		05/04/17 08:36	05/08/17 07:57	1
N-Nitrosodi-n-propylamine	5.3	U	5.3	ug/L		05/04/17 08:36	05/08/17 07:57	1
N-Nitrosodiphenylamine	5.3	U	5.3	ug/L		05/04/17 08:36	05/08/17 07:57	1
Pentachlorophenol	5.3	U	5.3	ug/L		05/04/17 08:36	05/08/17 07:57	1
Phenol	5.3	U	5.3	ug/L		05/04/17 08:36	05/08/17 07:57	1
Phenanthrene	2.1	U	2.1	ug/L		05/04/17 08:36	05/08/17 07:57	1
Pyrene	5.3	U	5.3	ug/L		05/04/17 08:36	05/08/17 07:57	1
3 & 4 Methylphenol	5.3	U	5.3	ug/L		05/04/17 08:36	05/08/17 07:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	83		42 - 120		05/04/17 08:36	05/08/17 07:57
2-Fluorophenol (Surr)	45		10 - 120		05/04/17 08:36	05/08/17 07:57
2,4,6-Tribromophenol (Surr)	78		35 - 125		05/04/17 08:36	05/08/17 07:57
Nitrobenzene-d5 (Surr)	82		36 - 120		05/04/17 08:36	05/08/17 07:57
Phenol-d5 (Surr)	28		10 - 120		05/04/17 08:36	05/08/17 07:57
Terphenyl-d14 (Surr)	80		17 - 120		05/04/17 08:36	05/08/17 07:57

# Client Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: GW-18224-050117-DC-004**

Date Collected: 05/01/17 12:40

Date Received: 05/02/17 11:15

**Lab Sample ID: 240-78922-4**

Matrix: Water

**Method: 8260B - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10	ug/L		05/09/17 14:43		1
Benzene	1.0	U	1.0	ug/L		05/09/17 14:43		1
Bromodichloromethane	1.0	U	1.0	ug/L		05/09/17 14:43		1
Bromoform	1.0	U	1.0	ug/L		05/09/17 14:43		1
Bromomethane	1.0	U	1.0	ug/L		05/09/17 14:43		1
2-Butanone (MEK)	10	U	10	ug/L		05/09/17 14:43		1
Carbon disulfide	5.0	U	5.0	ug/L		05/09/17 14:43		1
Carbon tetrachloride	1.0	U	1.0	ug/L		05/09/17 14:43		1
<b>Chlorobenzene</b>	<b>35</b>		1.0	ug/L		05/09/17 14:43		1
Chloroethane	1.0	U	1.0	ug/L		05/09/17 14:43		1
Chloroform	1.0	U	1.0	ug/L		05/09/17 14:43		1
Chloromethane	1.0	U	1.0	ug/L		05/09/17 14:43		1
1,1-Dichloroethane	1.0	U	1.0	ug/L		05/09/17 14:43		1
1,2-Dichloroethane	1.0	U	1.0	ug/L		05/09/17 14:43		1
1,1-Dichloroethene	1.0	U	1.0	ug/L		05/09/17 14:43		1
1,2-Dichloropropane	1.0	U	1.0	ug/L		05/09/17 14:43		1
cis-1,3-Dichloropropene	1.0	U	1.0	ug/L		05/09/17 14:43		1
trans-1,3-Dichloropropene	1.0	U	1.0	ug/L		05/09/17 14:43		1
Ethylbenzene	1.0	U	1.0	ug/L		05/09/17 14:43		1
2-Hexanone	10	U	10	ug/L		05/09/17 14:43		1
Methylene Chloride	5.0	U	5.0	ug/L		05/09/17 14:43		1
4-Methyl-2-pentanone (MIBK)	10	U	10	ug/L		05/09/17 14:43		1
Styrene	1.0	U	1.0	ug/L		05/09/17 14:43		1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	ug/L		05/09/17 14:43		1
Tetrachloroethene	1.0	U	1.0	ug/L		05/09/17 14:43		1
Toluene	1.0	U	1.0	ug/L		05/09/17 14:43		1
Trichloroethene	1.0	U	1.0	ug/L		05/09/17 14:43		1
Vinyl chloride	1.0	U	1.0	ug/L		05/09/17 14:43		1
Xylenes, Total	2.0	U	2.0	ug/L		05/09/17 14:43		1
1,1,1-Trichloroethane	1.0	U *	1.0	ug/L		05/09/17 14:43		1
1,1,2-Trichloroethane	1.0	U	1.0	ug/L		05/09/17 14:43		1
Cyclohexane	1.0	U	1.0	ug/L		05/09/17 14:43		1
1,2-Dibromo-3-Chloropropane	1.0	U	1.0	ug/L		05/09/17 14:43		1
1,2-Dibromoethane	1.0	U	1.0	ug/L		05/09/17 14:43		1
Dichlorodifluoromethane	1.0	U	1.0	ug/L		05/09/17 14:43		1
cis-1,2-Dichloroethene	1.0	U	1.0	ug/L		05/09/17 14:43		1
trans-1,2-Dichloroethene	1.0	U	1.0	ug/L		05/09/17 14:43		1
Isopropylbenzene	1.0	U	1.0	ug/L		05/09/17 14:43		1
Methyl acetate	10	U	10	ug/L		05/09/17 14:43		1
Methyl tert-butyl ether	1.0	U *	1.0	ug/L		05/09/17 14:43		1
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	1.0	ug/L		05/09/17 14:43		1
1,2,4-Trichlorobenzene	1.0	U	1.0	ug/L		05/09/17 14:43		1
<b>1,2-Dichlorobenzene</b>	<b>3.1</b>		1.0	ug/L		05/09/17 14:43		1
<b>1,3-Dichlorobenzene</b>	<b>2.4</b>		1.0	ug/L		05/09/17 14:43		1
<b>1,4-Dichlorobenzene</b>	<b>7.7</b>		1.0	ug/L		05/09/17 14:43		1
Trichlorofluoromethane	1.0	U *	1.0	ug/L		05/09/17 14:43		1
Dibromochloromethane	1.0	U	1.0	ug/L		05/09/17 14:43		1
Methylcyclohexane	1.0	U	1.0	ug/L		05/09/17 14:43		1

TestAmerica Canton

# Client Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: GW-18224-050117-DC-004**

**Date Collected: 05/01/17 12:40**

**Date Received: 05/02/17 11:15**

**Lab Sample ID: 240-78922-4**

**Matrix: Water**

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	114		61 - 138		05/09/17 14:43	1
4-Bromofluorobenzene (Surr)	96		69 - 120		05/09/17 14:43	1
Toluene-d8 (Surr)	97		73 - 120		05/09/17 14:43	1
Dibromofluoromethane (Surr)	111		69 - 124		05/09/17 14:43	1

## Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
2,2'-oxybis[1-chloropropane]	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
2,4,5-Trichlorophenol	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
2,4,6-Trichlorophenol	3.8	U	3.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
2,4-Dichlorophenol	9.5	U	9.5	ug/L	05/04/17 08:32	05/08/17 17:45		1
2,4-Dimethylphenol	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
2,4-Dinitrophenol	19	U	19	ug/L	05/04/17 08:32	05/08/17 17:45		1
2,4-Dinitrotoluene	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
2,6-Dinitrotoluene	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
2-Chloronaphthalene	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
2-Chlorophenol	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
2-Methylnaphthalene	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
2-Methylphenol	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
2-Nitroaniline	19	U	19	ug/L	05/04/17 08:32	05/08/17 17:45		1
2-Nitrophenol	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
3,3'-Dichlorobenzidine	0.95	U	0.95	ug/L	05/04/17 08:32	05/08/17 17:45		1
3-Nitroaniline	19	U	19	ug/L	05/04/17 08:32	05/08/17 17:45		1
4,6-Dinitro-2-methylphenol	19	U	19	ug/L	05/04/17 08:32	05/08/17 17:45		1
4-Bromophenyl phenyl ether	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
4-Chloro-3-methylphenol	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
4-Chloroaniline	9.5	U	9.5	ug/L	05/04/17 08:32	05/08/17 17:45		1
4-Chlorophenyl phenyl ether	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
4-Nitroaniline	19	U	19	ug/L	05/04/17 08:32	05/08/17 17:45		1
4-Nitrophenol	19	U	19	ug/L	05/04/17 08:32	05/08/17 17:45		1
Acenaphthene	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
Acenaphthylene	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
Acetophenone	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
Anthracene	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
Atrazine	2.9	U	2.9	ug/L	05/04/17 08:32	05/08/17 17:45		1
Benzaldehyde	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
Benzo[a]anthracene	0.95	U	0.95	ug/L	05/04/17 08:32	05/08/17 17:45		1
Benzo[a]pyrene	0.95	U	0.95	ug/L	05/04/17 08:32	05/08/17 17:45		1
Benzo[b]fluoranthene	0.95	U	0.95	ug/L	05/04/17 08:32	05/08/17 17:45		1
Benzo[g,h,i]perylene	0.95	U	0.95	ug/L	05/04/17 08:32	05/08/17 17:45		1
Benzo[k]fluoranthene	0.95	U	0.95	ug/L	05/04/17 08:32	05/08/17 17:45		1
Bis(2-chloroethoxy)methane	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
Bis(2-chloroethyl)ether	0.95	U	0.95	ug/L	05/04/17 08:32	05/08/17 17:45		1
Bis(2-ethylhexyl) phthalate	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
Butyl benzyl phthalate	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
Caprolactam	9.5	U	9.5	ug/L	05/04/17 08:32	05/08/17 17:45		1
Carbazole	9.5	U	9.5	ug/L	05/04/17 08:32	05/08/17 17:45		1
Chrysene	0.95	U	0.95	ug/L	05/04/17 08:32	05/08/17 17:45		1
Dibenzo(a,h)anthracene	1.9	U	1.9	ug/L	05/04/17 08:32	05/08/17 17:45		1

TestAmerica Canton

# Client Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: GW-18224-050117-DC-004**

**Lab Sample ID: 240-78922-4**

**Matrix: Water**

Date Collected: 05/01/17 12:40

Date Received: 05/02/17 11:15

## Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenzofuran	3.8	U	3.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
Diethyl phthalate	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
Dimethyl phthalate	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
Di-n-butyl phthalate	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
Di-n-octyl phthalate	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
Fluoranthene	0.95	U	0.95	ug/L	05/04/17 08:32	05/08/17 17:45		1
Fluorene	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
Hexachlorobenzene	0.19	U	0.19	ug/L	05/04/17 08:32	05/08/17 17:45		1
Hexachlorobutadiene	0.95	U	0.95	ug/L	05/04/17 08:32	05/08/17 17:45		1
Hexachlorocyclopentadiene	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
Hexachloroethane	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
Indeno[1,2,3-cd]pyrene	1.9	U	1.9	ug/L	05/04/17 08:32	05/08/17 17:45		1
Isophorone	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
Naphthalene	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
Nitrobenzene	2.9	U	2.9	ug/L	05/04/17 08:32	05/08/17 17:45		1
N-Nitrosodi-n-propylamine	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
N-Nitrosodiphenylamine	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
Pentachlorophenol	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
Phenol	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
Phenanthrene	1.9	U	1.9	ug/L	05/04/17 08:32	05/08/17 17:45		1
Pyrene	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1
3 & 4 Methylphenol	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 17:45		1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	71		42 - 120	05/04/17 08:32	05/08/17 17:45	1
2-Fluorophenol (Surr)	42		10 - 120	05/04/17 08:32	05/08/17 17:45	1
2,4,6-Tribromophenol (Surr)	82		35 - 125	05/04/17 08:32	05/08/17 17:45	1
Nitrobenzene-d5 (Surr)	78		36 - 120	05/04/17 08:32	05/08/17 17:45	1
Phenol-d5 (Surr)	26		10 - 120	05/04/17 08:32	05/08/17 17:45	1
Terphenyl-d14 (Surr)	75		17 - 120	05/04/17 08:32	05/08/17 17:45	1

# Client Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: GW-18224-050117-DC-005**

Date Collected: 05/01/17 14:05

Date Received: 05/02/17 11:15

**Lab Sample ID: 240-78922-5**

Matrix: Water

**Method: 8260B - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	250	U	250	ug/L			05/09/17 15:06	25
<b>Benzene</b>	<b>340</b>		25	ug/L			05/09/17 15:06	25
Bromodichloromethane	25	U	25	ug/L			05/09/17 15:06	25
Bromoform	25	U	25	ug/L			05/09/17 15:06	25
Bromomethane	25	U	25	ug/L			05/09/17 15:06	25
2-Butanone (MEK)	250	U	250	ug/L			05/09/17 15:06	25
Carbon disulfide	130	U	130	ug/L			05/09/17 15:06	25
Carbon tetrachloride	25	U	25	ug/L			05/09/17 15:06	25
<b>Chlorobenzene</b>	<b>660</b>		25	ug/L			05/09/17 15:06	25
Chloroethane	25	U	25	ug/L			05/09/17 15:06	25
Chloroform	25	U	25	ug/L			05/09/17 15:06	25
Chloromethane	25	U	25	ug/L			05/09/17 15:06	25
1,1-Dichloroethane	25	U	25	ug/L			05/09/17 15:06	25
1,2-Dichloroethane	25	U	25	ug/L			05/09/17 15:06	25
1,1-Dichloroethene	25	U	25	ug/L			05/09/17 15:06	25
1,2-Dichloropropane	25	U	25	ug/L			05/09/17 15:06	25
cis-1,3-Dichloropropene	25	U	25	ug/L			05/09/17 15:06	25
trans-1,3-Dichloropropene	25	U	25	ug/L			05/09/17 15:06	25
Ethylbenzene	25	U	25	ug/L			05/09/17 15:06	25
2-Hexanone	250	U	250	ug/L			05/09/17 15:06	25
Methylene Chloride	130	U	130	ug/L			05/09/17 15:06	25
4-Methyl-2-pentanone (MIBK)	250	U	250	ug/L			05/09/17 15:06	25
Styrene	25	U	25	ug/L			05/09/17 15:06	25
1,1,2,2-Tetrachloroethane	25	U	25	ug/L			05/09/17 15:06	25
Tetrachloroethene	25	U	25	ug/L			05/09/17 15:06	25
<b>Toluene</b>	<b>82</b>		25	ug/L			05/09/17 15:06	25
Trichloroethene	25	U	25	ug/L			05/09/17 15:06	25
Vinyl chloride	25	U	25	ug/L			05/09/17 15:06	25
Xylenes, Total	50	U	50	ug/L			05/09/17 15:06	25
1,1,1-Trichloroethane	25	U *	25	ug/L			05/09/17 15:06	25
1,1,2-Trichloroethane	25	U	25	ug/L			05/09/17 15:06	25
Cyclohexane	25	U	25	ug/L			05/09/17 15:06	25
1,2-Dibromo-3-Chloropropane	25	U	25	ug/L			05/09/17 15:06	25
1,2-Dibromoethane	25	U	25	ug/L			05/09/17 15:06	25
Dichlorodifluoromethane	25	U	25	ug/L			05/09/17 15:06	25
cis-1,2-Dichloroethene	25	U	25	ug/L			05/09/17 15:06	25
trans-1,2-Dichloroethene	25	U	25	ug/L			05/09/17 15:06	25
Isopropylbenzene	25	U	25	ug/L			05/09/17 15:06	25
Methyl acetate	250	U	250	ug/L			05/09/17 15:06	25
Methyl tert-butyl ether	25	U *	25	ug/L			05/09/17 15:06	25
1,1,2-Trichloro-1,2,2-trifluoroethane	25	U	25	ug/L			05/09/17 15:06	25
1,2,4-Trichlorobenzene	25	U	25	ug/L			05/09/17 15:06	25
<b>1,2-Dichlorobenzene</b>	<b>30</b>		25	ug/L			05/09/17 15:06	25
<b>1,3-Dichlorobenzene</b>	<b>33</b>		25	ug/L			05/09/17 15:06	25
<b>1,4-Dichlorobenzene</b>	<b>170</b>		25	ug/L			05/09/17 15:06	25
Trichlorofluoromethane	25	U *	25	ug/L			05/09/17 15:06	25
Dibromochloromethane	25	U	25	ug/L			05/09/17 15:06	25
Methylcyclohexane	25	U	25	ug/L			05/09/17 15:06	25

TestAmerica Canton

# Client Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: GW-18224-050117-DC-005**

**Date Collected: 05/01/17 14:05**

**Date Received: 05/02/17 11:15**

**Lab Sample ID: 240-78922-5**

**Matrix: Water**

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	111		61 - 138		05/09/17 15:06	25
4-Bromofluorobenzene (Surr)	92		69 - 120		05/09/17 15:06	25
Toluene-d8 (Surr)	96		73 - 120		05/09/17 15:06	25
Dibromofluoromethane (Surr)	108		69 - 124		05/09/17 15:06	25

## Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
2,2'-oxybis[1-chloropropane]	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
2,4,5-Trichlorophenol	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
2,4,6-Trichlorophenol	19	U	19	ug/L	05/04/17 08:32	05/08/17 18:33		5
2,4-Dichlorophenol	48	U	48	ug/L	05/04/17 08:32	05/08/17 18:33		5
<b>2,4-Dimethylphenol</b>	<b>43</b>		24	ug/L	05/04/17 08:32	05/08/17 18:33		5
2,4-Dinitrophenol	95	U	95	ug/L	05/04/17 08:32	05/08/17 18:33		5
2,4-Dinitrotoluene	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
2,6-Dinitrotoluene	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
<b>2-Chloronaphthalene</b>	<b>91</b>		24	ug/L	05/04/17 08:32	05/08/17 18:33		5
2-Chlorophenol	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
2-Methylnaphthalene	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
2-Methylphenol	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
2-Nitroaniline	95	U	95	ug/L	05/04/17 08:32	05/08/17 18:33		5
2-Nitrophenol	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
3,3'-Dichlorobenzidine	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 18:33		5
3-Nitroaniline	95	U	95	ug/L	05/04/17 08:32	05/08/17 18:33		5
4,6-Dinitro-2-methylphenol	95	U	95	ug/L	05/04/17 08:32	05/08/17 18:33		5
4-Bromophenyl phenyl ether	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
4-Chloro-3-methylphenol	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
4-Chloroaniline	48	U	48	ug/L	05/04/17 08:32	05/08/17 18:33		5
4-Chlorophenyl phenyl ether	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
4-Nitroaniline	95	U	95	ug/L	05/04/17 08:32	05/08/17 18:33		5
4-Nitrophenol	95	U	95	ug/L	05/04/17 08:32	05/08/17 18:33		5
Acenaphthene	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
Acenaphthylene	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
Acetophenone	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
Anthracene	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
Atrazine	14	U	14	ug/L	05/04/17 08:32	05/08/17 18:33		5
Benzaldehyde	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
Benzo[a]anthracene	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 18:33		5
Benzo[a]pyrene	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 18:33		5
Benzo[b]fluoranthene	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 18:33		5
Benzo[g,h,i]perylene	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 18:33		5
Benzo[k]fluoranthene	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 18:33		5
Bis(2-chloroethoxy)methane	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
Bis(2-chloroethyl)ether	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 18:33		5
Bis(2-ethylhexyl) phthalate	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
Butyl benzyl phthalate	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
Caprolactam	48	U	48	ug/L	05/04/17 08:32	05/08/17 18:33		5
Carbazole	48	U	48	ug/L	05/04/17 08:32	05/08/17 18:33		5
Chrysene	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 18:33		5
Dibenzo(a,h)anthracene	9.5	U	9.5	ug/L	05/04/17 08:32	05/08/17 18:33		5

TestAmerica Canton

# Client Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: GW-18224-050117-DC-005**

**Lab Sample ID: 240-78922-5**

**Matrix: Water**

Date Collected: 05/01/17 14:05

Date Received: 05/02/17 11:15

**Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenzofuran	19	U	19	ug/L	05/04/17 08:32	05/08/17 18:33		5
Diethyl phthalate	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
Dimethyl phthalate	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
Di-n-butyl phthalate	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
Di-n-octyl phthalate	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
Fluoranthene	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 18:33		5
Fluorene	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
Hexachlorobenzene	0.95	U	0.95	ug/L	05/04/17 08:32	05/08/17 18:33		5
Hexachlorobutadiene	4.8	U	4.8	ug/L	05/04/17 08:32	05/08/17 18:33		5
Hexachlorocyclopentadiene	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
Hexachloroethane	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
Indeno[1,2,3-cd]pyrene	9.5	U	9.5	ug/L	05/04/17 08:32	05/08/17 18:33		5
Isophorone	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
<b>Naphthalene</b>	<b>120</b>		24	ug/L	05/04/17 08:32	05/08/17 18:33		5
Nitrobenzene	14	U	14	ug/L	05/04/17 08:32	05/08/17 18:33		5
N-Nitrosodi-n-propylamine	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
N-Nitrosodiphenylamine	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
Pentachlorophenol	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
Phenol	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
Phenanthrene	9.5	U	9.5	ug/L	05/04/17 08:32	05/08/17 18:33		5
Pyrene	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
3 & 4 Methylphenol	24	U	24	ug/L	05/04/17 08:32	05/08/17 18:33		5
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>		<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>	
2-Fluorobiphenyl (Surr)	94		42 - 120		05/04/17 08:32	05/08/17 18:33		5
2-Fluorophenol (Surr)	43		10 - 120		05/04/17 08:32	05/08/17 18:33		5
2,4,6-Tribromophenol (Surr)	98		35 - 125		05/04/17 08:32	05/08/17 18:33		5
Nitrobenzene-d5 (Surr)	90		36 - 120		05/04/17 08:32	05/08/17 18:33		5
Phenol-d5 (Surr)	27		10 - 120		05/04/17 08:32	05/08/17 18:33		5
Terphenyl-d14 (Surr)	92		17 - 120		05/04/17 08:32	05/08/17 18:33		5

# Client Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: GW-18224-050117-DC-006**

Date Collected: 05/01/17 14:45

Date Received: 05/02/17 11:15

**Lab Sample ID: 240-78922-6**

Matrix: Water

**Method: 8260B - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	33	U	33	ug/L			05/10/17 12:32	3.33
Benzene	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
Bromodichloromethane	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
Bromoform	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
Bromomethane	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
2-Butanone (MEK)	33	U	33	ug/L			05/10/17 12:32	3.33
Carbon disulfide	17	U	17	ug/L			05/10/17 12:32	3.33
Carbon tetrachloride	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
Chlorobenzene	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
<b>Chloroethane</b>	<b>57</b>		3.3	ug/L			05/10/17 12:32	3.33
Chloroform	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
Chloromethane	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
1,1-Dichloroethane	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
1,2-Dichloroethane	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
1,1-Dichloroethene	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
1,2-Dichloropropane	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
cis-1,3-Dichloropropene	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
trans-1,3-Dichloropropene	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
Ethylbenzene	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
2-Hexanone	33	U	33	ug/L			05/10/17 12:32	3.33
Methylene Chloride	17	U	17	ug/L			05/10/17 12:32	3.33
4-Methyl-2-pentanone (MIBK)	33	U	33	ug/L			05/10/17 12:32	3.33
Styrene	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
1,1,2,2-Tetrachloroethane	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
Tetrachloroethene	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
Toluene	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
Trichloroethene	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
Vinyl chloride	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
Xylenes, Total	6.7	U	6.7	ug/L			05/10/17 12:32	3.33
1,1,1-Trichloroethane	3.3	U *	3.3	ug/L			05/10/17 12:32	3.33
1,1,2-Trichloroethane	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
Cyclohexane	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
1,2-Dibromo-3-Chloropropane	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
1,2-Dibromoethane	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
Dichlorodifluoromethane	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
cis-1,2-Dichloroethene	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
trans-1,2-Dichloroethene	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
Isopropylbenzene	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
Methyl acetate	33	U	33	ug/L			05/10/17 12:32	3.33
Methyl tert-butyl ether	3.3	U *	3.3	ug/L			05/10/17 12:32	3.33
1,1,2-Trichloro-1,2,2-trifluoroethane	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
1,2,4-Trichlorobenzene	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
1,2-Dichlorobenzene	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
1,3-Dichlorobenzene	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
1,4-Dichlorobenzene	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
Trichlorofluoromethane	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
Dibromochloromethane	3.3	U	3.3	ug/L			05/10/17 12:32	3.33
Methylcyclohexane	3.3	U	3.3	ug/L			05/10/17 12:32	3.33

TestAmerica Canton

# Client Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: GW-18224-050117-DC-006**

**Date Collected: 05/01/17 14:45**

**Date Received: 05/02/17 11:15**

**Lab Sample ID: 240-78922-6**

**Matrix: Water**

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	116		61 - 138		05/10/17 12:32	3.33
4-Bromofluorobenzene (Surr)	93		69 - 120		05/10/17 12:32	3.33
Toluene-d8 (Surr)	100		73 - 120		05/10/17 12:32	3.33
Dibromofluoromethane (Surr)	113		69 - 124		05/10/17 12:32	3.33

## Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
2,2'-oxybis[1-chloropropane]	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
2,4,5-Trichlorophenol	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
2,4,6-Trichlorophenol	4.0	U	4.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
2,4-Dichlorophenol	10	U	10	ug/L	05/04/17 08:32	05/08/17 18:09		1
2,4-Dimethylphenol	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
2,4-Dinitrophenol	20	U	20	ug/L	05/04/17 08:32	05/08/17 18:09		1
2,4-Dinitrotoluene	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
2,6-Dinitrotoluene	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
2-Chloronaphthalene	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
2-Chlorophenol	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
2-Methylnaphthalene	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
2-Methylphenol	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
2-Nitroaniline	20	U	20	ug/L	05/04/17 08:32	05/08/17 18:09		1
2-Nitrophenol	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
3,3'-Dichlorobenzidine	1.0	U	1.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
3-Nitroaniline	20	U	20	ug/L	05/04/17 08:32	05/08/17 18:09		1
4,6-Dinitro-2-methylphenol	20	U	20	ug/L	05/04/17 08:32	05/08/17 18:09		1
4-Bromophenyl phenyl ether	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
4-Chloro-3-methylphenol	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
4-Chloroaniline	10	U	10	ug/L	05/04/17 08:32	05/08/17 18:09		1
4-Chlorophenyl phenyl ether	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
4-Nitroaniline	20	U	20	ug/L	05/04/17 08:32	05/08/17 18:09		1
4-Nitrophenol	20	U	20	ug/L	05/04/17 08:32	05/08/17 18:09		1
Acenaphthene	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Acenaphthylene	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Acetophenone	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Anthracene	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Atrazine	3.0	U	3.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Benzaldehyde	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Benzo[a]anthracene	1.0	U	1.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Benzo[a]pyrene	1.0	U	1.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Benzo[b]fluoranthene	1.0	U	1.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Benzo[g,h,i]perylene	1.0	U	1.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Benzo[k]fluoranthene	1.0	U	1.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Bis(2-chloroethoxy)methane	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Bis(2-chloroethyl)ether	1.0	U	1.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Bis(2-ethylhexyl) phthalate	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Butyl benzyl phthalate	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Caprolactam	10	U	10	ug/L	05/04/17 08:32	05/08/17 18:09		1
Carbazole	10	U	10	ug/L	05/04/17 08:32	05/08/17 18:09		1
Chrysene	1.0	U	1.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Dibenzo(a,h)anthracene	2.0	U	2.0	ug/L	05/04/17 08:32	05/08/17 18:09		1

TestAmerica Canton

# Client Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: GW-18224-050117-DC-006**

**Lab Sample ID: 240-78922-6**

**Matrix: Water**

Date Collected: 05/01/17 14:45

Date Received: 05/02/17 11:15

## Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenzofuran	4.0	U	4.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Diethyl phthalate	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Dimethyl phthalate	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Di-n-butyl phthalate	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Di-n-octyl phthalate	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Fluoranthene	1.0	U	1.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Fluorene	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Hexachlorobenzene	0.20	U	0.20	ug/L	05/04/17 08:32	05/08/17 18:09		1
Hexachlorobutadiene	1.0	U	1.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Hexachlorocyclopentadiene	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Hexachloroethane	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Indeno[1,2,3-cd]pyrene	2.0	U	2.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Isophorone	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Naphthalene	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Nitrobenzene	3.0	U	3.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
N-Nitrosodi-n-propylamine	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
N-Nitrosodiphenylamine	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Pentachlorophenol	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Phenol	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Phenanthrene	2.0	U	2.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
Pyrene	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1
3 & 4 Methylphenol	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 18:09		1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	62		42 - 120	05/04/17 08:32	05/08/17 18:09	1
2-Fluorophenol (Surr)	44		10 - 120	05/04/17 08:32	05/08/17 18:09	1
2,4,6-Tribromophenol (Surr)	74		35 - 125	05/04/17 08:32	05/08/17 18:09	1
Nitrobenzene-d5 (Surr)	81		36 - 120	05/04/17 08:32	05/08/17 18:09	1
Phenol-d5 (Surr)	27		10 - 120	05/04/17 08:32	05/08/17 18:09	1
Terphenyl-d14 (Surr)	55		17 - 120	05/04/17 08:32	05/08/17 18:09	1

# Client Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: TB-18224-050117**

Date Collected: 05/01/17 00:00

Date Received: 05/02/17 11:15

**Lab Sample ID: 240-78922-7**

Matrix: Water

**Method: 8260B - Volatile Organic Compounds (GC/MS)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10	ug/L			05/09/17 15:50	1
Benzene	1.0	U	1.0	ug/L			05/09/17 15:50	1
Bromodichloromethane	1.0	U	1.0	ug/L			05/09/17 15:50	1
Bromoform	1.0	U	1.0	ug/L			05/09/17 15:50	1
Bromomethane	1.0	U	1.0	ug/L			05/09/17 15:50	1
2-Butanone (MEK)	10	U	10	ug/L			05/09/17 15:50	1
Carbon disulfide	5.0	U	5.0	ug/L			05/09/17 15:50	1
Carbon tetrachloride	1.0	U	1.0	ug/L			05/09/17 15:50	1
Chlorobenzene	1.0	U	1.0	ug/L			05/09/17 15:50	1
Chloroethane	1.0	U	1.0	ug/L			05/09/17 15:50	1
Chloroform	1.0	U	1.0	ug/L			05/09/17 15:50	1
Chloromethane	1.0	U	1.0	ug/L			05/09/17 15:50	1
1,1-Dichloroethane	1.0	U	1.0	ug/L			05/09/17 15:50	1
1,2-Dichloroethane	1.0	U	1.0	ug/L			05/09/17 15:50	1
1,1-Dichloroethene	1.0	U	1.0	ug/L			05/09/17 15:50	1
1,2-Dichloropropane	1.0	U	1.0	ug/L			05/09/17 15:50	1
cis-1,3-Dichloropropene	1.0	U	1.0	ug/L			05/09/17 15:50	1
trans-1,3-Dichloropropene	1.0	U	1.0	ug/L			05/09/17 15:50	1
Ethylbenzene	1.0	U	1.0	ug/L			05/09/17 15:50	1
2-Hexanone	10	U	10	ug/L			05/09/17 15:50	1
Methylene Chloride	5.0	U	5.0	ug/L			05/09/17 15:50	1
4-Methyl-2-pentanone (MIBK)	10	U	10	ug/L			05/09/17 15:50	1
Styrene	1.0	U	1.0	ug/L			05/09/17 15:50	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	ug/L			05/09/17 15:50	1
Tetrachloroethene	1.0	U	1.0	ug/L			05/09/17 15:50	1
Toluene	1.0	U	1.0	ug/L			05/09/17 15:50	1
Trichloroethene	1.0	U	1.0	ug/L			05/09/17 15:50	1
Vinyl chloride	1.0	U	1.0	ug/L			05/09/17 15:50	1
Xylenes, Total	2.0	U	2.0	ug/L			05/09/17 15:50	1
1,1,1-Trichloroethane	1.0	U *	1.0	ug/L			05/09/17 15:50	1
1,1,2-Trichloroethane	1.0	U	1.0	ug/L			05/09/17 15:50	1
Cyclohexane	1.0	U	1.0	ug/L			05/09/17 15:50	1
1,2-Dibromo-3-Chloropropane	1.0	U	1.0	ug/L			05/09/17 15:50	1
1,2-Dibromoethane	1.0	U	1.0	ug/L			05/09/17 15:50	1
Dichlorodifluoromethane	1.0	U	1.0	ug/L			05/09/17 15:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	ug/L			05/09/17 15:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	ug/L			05/09/17 15:50	1
Isopropylbenzene	1.0	U	1.0	ug/L			05/09/17 15:50	1
Methyl acetate	10	U	10	ug/L			05/09/17 15:50	1
Methyl tert-butyl ether	1.0	U *	1.0	ug/L			05/09/17 15:50	1
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	1.0	ug/L			05/09/17 15:50	1
1,2,4-Trichlorobenzene	1.0	U	1.0	ug/L			05/09/17 15:50	1
1,2-Dichlorobenzene	1.0	U	1.0	ug/L			05/09/17 15:50	1
1,3-Dichlorobenzene	1.0	U	1.0	ug/L			05/09/17 15:50	1
1,4-Dichlorobenzene	1.0	U	1.0	ug/L			05/09/17 15:50	1
Trichlorofluoromethane	1.0	U *	1.0	ug/L			05/09/17 15:50	1
Dibromochloromethane	1.0	U	1.0	ug/L			05/09/17 15:50	1
Methylcyclohexane	1.0	U	1.0	ug/L			05/09/17 15:50	1

TestAmerica Canton

# Client Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: TB-18224-050117**

Date Collected: 05/01/17 00:00

Date Received: 05/02/17 11:15

**Lab Sample ID: 240-78922-7**

Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	112		61 - 138		05/09/17 15:50	1
4-Bromofluorobenzene (Surr)	95		69 - 120		05/09/17 15:50	1
Toluene-d8 (Surr)	96		73 - 120		05/09/17 15:50	1
Dibromofluoromethane (Surr)	115		69 - 124		05/09/17 15:50	1

# Surrogate Summary

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		12DCE (61-138)	BFB (69-120)	TOL (73-120)	DBFM (69-124)
240-78922-1	GW-18224-050117-DC-001	116	96	100	120
240-78922-2	GW-18224-050117-DC-002	115	89	98	116
240-78922-3	GW-18224-050117-DC-003	111	90	97	116
240-78922-3 MS	GW-18224-050117-DC-003	109	105	103	108
240-78922-3 MSD	GW-18224-050117-DC-003	105	106	103	110
240-78922-4	GW-18224-050117-DC-004	114	96	97	111
240-78922-5	GW-18224-050117-DC-005	111	92	96	108
240-78922-6	GW-18224-050117-DC-006	116	93	100	113
240-78922-7	TB-18224-050117	112	95	96	115
LCS 240-278134/4	Lab Control Sample	106	106	105	110
LCS 240-278328/4	Lab Control Sample	107	105	106	111
MB 240-278134/6	Method Blank	113	98	98	111
MB 240-278328/6	Method Blank	115	94	97	109

### Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)

BFB = 4-Bromofluorobenzene (Surr)

TOL = Toluene-d8 (Surr)

DBFM = Dibromofluoromethane (Surr)

## Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)					
		FBP (42-120)	2FP (10-120)	TBP (35-125)	NBZ (36-120)	PHL (10-120)	TPH (17-120)
240-78922-1	GW-18224-050117-DC-001	78	41	74	78	25	74
240-78922-2	GW-18224-050117-DC-002	70	34	69	68	20	67
240-78922-3	GW-18224-050117-DC-003	83	45	78	82	28	80
240-78922-3 MS	GW-18224-050117-DC-003	88	50	91	96	30	73
240-78922-3 MSD	GW-18224-050117-DC-003	91	47	93	97	29	72
240-78922-4	GW-18224-050117-DC-004	71	42	82	78	26	75
240-78922-5	GW-18224-050117-DC-005	94	43	98	90	27	92
240-78922-6	GW-18224-050117-DC-006	62	44	74	81	27	55
LCS 240-277475/21-A	Lab Control Sample	96	52	90	101	34	97
LCS 240-277477/21-A	Lab Control Sample	88	54	86	94	35	85
MB 240-277475/20-A	Method Blank	89	54	77	91	35	102
MB 240-277477/20-A	Method Blank	82	50	69	80	32	79

### Surrogate Legend

FBP = 2-Fluorobiphenyl (Surr)

2FP = 2-Fluorophenol (Surr)

TBP = 2,4,6-Tribromophenol (Surr)

NBZ = Nitrobenzene-d5 (Surr)

PHL = Phenol-d5 (Surr)

TPH = Terphenyl-d14 (Surr)

TestAmerica Canton

# QC Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 240-278134/6**

**Matrix: Water**

**Analysis Batch: 278134**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10	ug/L		05/09/17 11:58		1
Benzene	1.0	U	1.0	ug/L		05/09/17 11:58		1
Bromodichloromethane	1.0	U	1.0	ug/L		05/09/17 11:58		1
Bromoform	1.0	U	1.0	ug/L		05/09/17 11:58		1
Bromomethane	1.0	U	1.0	ug/L		05/09/17 11:58		1
2-Butanone (MEK)	10	U	10	ug/L		05/09/17 11:58		1
Carbon disulfide	5.0	U	5.0	ug/L		05/09/17 11:58		1
Carbon tetrachloride	1.0	U	1.0	ug/L		05/09/17 11:58		1
Chlorobenzene	1.0	U	1.0	ug/L		05/09/17 11:58		1
Chloroethane	1.0	U	1.0	ug/L		05/09/17 11:58		1
Chloroform	1.0	U	1.0	ug/L		05/09/17 11:58		1
Chloromethane	1.0	U	1.0	ug/L		05/09/17 11:58		1
1,1-Dichloroethane	1.0	U	1.0	ug/L		05/09/17 11:58		1
1,2-Dichloroethane	1.0	U	1.0	ug/L		05/09/17 11:58		1
1,1-Dichloroethene	1.0	U	1.0	ug/L		05/09/17 11:58		1
1,2-Dichloropropane	1.0	U	1.0	ug/L		05/09/17 11:58		1
cis-1,3-Dichloropropene	1.0	U	1.0	ug/L		05/09/17 11:58		1
trans-1,3-Dichloropropene	1.0	U	1.0	ug/L		05/09/17 11:58		1
Ethylbenzene	1.0	U	1.0	ug/L		05/09/17 11:58		1
2-Hexanone	10	U	10	ug/L		05/09/17 11:58		1
Methylene Chloride	5.0	U	5.0	ug/L		05/09/17 11:58		1
4-Methyl-2-pentanone (MIBK)	10	U	10	ug/L		05/09/17 11:58		1
Styrene	1.0	U	1.0	ug/L		05/09/17 11:58		1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	ug/L		05/09/17 11:58		1
Tetrachloroethene	1.0	U	1.0	ug/L		05/09/17 11:58		1
Toluene	1.0	U	1.0	ug/L		05/09/17 11:58		1
Trichloroethene	1.0	U	1.0	ug/L		05/09/17 11:58		1
Vinyl chloride	1.0	U	1.0	ug/L		05/09/17 11:58		1
Xylenes, Total	2.0	U	2.0	ug/L		05/09/17 11:58		1
1,1,1-Trichloroethane	1.0	U	1.0	ug/L		05/09/17 11:58		1
1,1,2-Trichloroethane	1.0	U	1.0	ug/L		05/09/17 11:58		1
Cyclohexane	1.0	U	1.0	ug/L		05/09/17 11:58		1
1,2-Dibromo-3-Chloropropane	1.0	U	1.0	ug/L		05/09/17 11:58		1
1,2-Dibromoethane	1.0	U	1.0	ug/L		05/09/17 11:58		1
Dichlorodifluoromethane	1.0	U	1.0	ug/L		05/09/17 11:58		1
cis-1,2-Dichloroethene	1.0	U	1.0	ug/L		05/09/17 11:58		1
trans-1,2-Dichloroethene	1.0	U	1.0	ug/L		05/09/17 11:58		1
Isopropylbenzene	1.0	U	1.0	ug/L		05/09/17 11:58		1
Methyl acetate	10	U	10	ug/L		05/09/17 11:58		1
Methyl tert-butyl ether	1.0	U	1.0	ug/L		05/09/17 11:58		1
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	1.0	ug/L		05/09/17 11:58		1
1,2,4-Trichlorobenzene	1.0	U	1.0	ug/L		05/09/17 11:58		1
1,2-Dichlorobenzene	1.0	U	1.0	ug/L		05/09/17 11:58		1
1,3-Dichlorobenzene	1.0	U	1.0	ug/L		05/09/17 11:58		1
1,4-Dichlorobenzene	1.0	U	1.0	ug/L		05/09/17 11:58		1
Trichlorofluoromethane	1.0	U	1.0	ug/L		05/09/17 11:58		1
Dibromochloromethane	1.0	U	1.0	ug/L		05/09/17 11:58		1
Methylcyclohexane	1.0	U	1.0	ug/L		05/09/17 11:58		1

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# QC Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

Surrogate	MB	MB	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac	3
1,2-Dichloroethane-d4 (Surr)			113		61 - 138		05/09/17 11:58	1	1
4-Bromofluorobenzene (Surr)			98		69 - 120		05/09/17 11:58	1	4
Toluene-d8 (Surr)			98		73 - 120		05/09/17 11:58	1	
Dibromofluoromethane (Surr)			111		69 - 124		05/09/17 11:58	1	5

Lab Sample ID: LCS 240-278134/4

Matrix: Water

Analysis Batch: 278134

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.	Limits	7
Acetone	20.0	18.5		ug/L		92	35 - 131		8
Benzene	10.0	11.5		ug/L		115	79 - 120		9
Bromodichloromethane	10.0	12.3		ug/L		123	79 - 125		10
Bromoform	10.0	9.09		ug/L		91	55 - 145		11
Bromomethane	10.0	9.66		ug/L		97	17 - 158		12
2-Butanone (MEK)	20.0	21.4		ug/L		107	43 - 149		13
Carbon disulfide	10.0	12.1		ug/L		121	49 - 141		14
Carbon tetrachloride	10.0	15.3		ug/L		153	55 - 171		
Chlorobenzene	10.0	10.8		ug/L		108	80 - 120		
Chloroethane	10.0	9.69		ug/L		97	10 - 149		
Chloroform	10.0	11.9		ug/L		119	80 - 120		
Chloromethane	10.0	12.4		ug/L		124	59 - 124		
1,1-Dichloroethane	10.0	11.8		ug/L		118	74 - 120		
1,2-Dichloroethane	10.0	11.5		ug/L		115	68 - 133		
1,1-Dichloroethene	10.0	10.8		ug/L		108	65 - 127		
1,2-Dichloropropane	10.0	12.5		ug/L		125	78 - 127		
cis-1,3-Dichloropropene	10.0	11.0		ug/L		110	75 - 120		
trans-1,3-Dichloropropene	10.0	10.5		ug/L		105	67 - 120		
Ethylbenzene	10.0	10.8		ug/L		108	80 - 120		
2-Hexanone	20.0	23.4		ug/L		117	28 - 169		
Methylene Chloride	10.0	12.1		ug/L		121	64 - 140		
4-Methyl-2-pentanone (MIBK)	20.0	25.7		ug/L		128	53 - 144		
Styrene	10.0	11.2		ug/L		112	80 - 121		
1,1,2,2-Tetrachloroethane	10.0	10.0		ug/L		100	58 - 122		
Tetrachloroethene	10.0	10.2		ug/L		102	80 - 122		
Toluene	10.0	11.1		ug/L		111	78 - 120		
Trichloroethene	10.0	11.0		ug/L		110	76 - 124		
Vinyl chloride	10.0	10.5		ug/L		105	65 - 124		
Xylenes, Total	20.0	21.6		ug/L		108	80 - 120		
1,1,1-Trichloroethane	10.0	14.8 *		ug/L		148	64 - 147		
1,1,2-Trichloroethane	10.0	11.1		ug/L		111	76 - 121		
Cyclohexane	10.0	11.7		ug/L		117	66 - 135		
1,2-Dibromo-3-Chloropropane	10.0	7.74		ug/L		77	50 - 130		
1,2-Dibromoethane	10.0	11.0		ug/L		110	80 - 120		
Dichlorodifluoromethane	10.0	11.2		ug/L		112	42 - 141		
cis-1,2-Dichloroethene	10.0	11.6		ug/L		116	77 - 120		
trans-1,2-Dichloroethene	10.0	11.9		ug/L		119	74 - 124		
Isopropylbenzene	10.0	11.0		ug/L		110	80 - 128		
Methyl acetate	20.0	25.4		ug/L		127	63 - 137		
Methyl tert-butyl ether	10.0	12.6 *		ug/L		126	73 - 120		
1,1,2-Trichloro-1,2,2-trifluoroethane	10.0	11.7		ug/L		117	65 - 144		
1,2,4-Trichlorobenzene	10.0	5.26		ug/L		53	34 - 141		
1,2-Dichlorobenzene	10.0	9.79		ug/L		98	80 - 120		

TestAmerica Canton

# QC Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCS 240-278134/4**

**Matrix: Water**

**Analysis Batch: 278134**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS		Unit	D	%Rec	%Rec.
		Result	Qualifier				
1,3-Dichlorobenzene	10.0	9.86		ug/L	99	80 - 120	
1,4-Dichlorobenzene	10.0	10.0		ug/L	100	80 - 120	
Trichlorofluoromethane	10.0	18.7 *		ug/L	187	27 - 176	
Dibromochloromethane	10.0	11.4		ug/L	114	64 - 129	
Methylcyclohexane	10.0	10.1		ug/L	101	63 - 141	

Surrogate	LCS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	106		61 - 138
4-Bromofluorobenzene (Surr)	106		69 - 120
Toluene-d8 (Surr)	105		73 - 120
Dibromofluoromethane (Surr)	110		69 - 124

**Lab Sample ID: 240-78922-3 MS**

**Matrix: Water**

**Analysis Batch: 278134**

**Client Sample ID: GW-18224-050117-DC-003**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS		Unit	D	%Rec	%Rec.
				Result	Qualifier				
Acetone	80	U	160	136		ug/L	85	19 - 133	
Benzene	8.0	U	80.0	86.9		ug/L	109	69 - 127	
Bromodichloromethane	8.0	U	80.0	94.6		ug/L	118	75 - 128	
Bromoform	8.0	U	80.0	72.0		ug/L	90	61 - 135	
Bromomethane	8.0	U	80.0	54.8		ug/L	68	10 - 148	
2-Butanone (MEK)	80	U	160	163		ug/L	102	34 - 153	
Carbon disulfide	40	U	80.0	92.9		ug/L	116	46 - 143	
Carbon tetrachloride	8.0	U	80.0	108		ug/L	134	53 - 175	
Chlorobenzene	8.0	U	80.0	76.4		ug/L	96	76 - 120	
Chloroethane	8.0	U	80.0	59.7		ug/L	75	10 - 141	
Chloroform	8.0	U	80.0	92.2		ug/L	115	74 - 125	
Chloromethane	8.0	U	80.0	59.6		ug/L	75	34 - 127	
1,1-Dichloroethane	8.0	U	80.0	91.5		ug/L	114	69 - 122	
1,2-Dichloroethane	8.0	U	80.0	91.5		ug/L	114	64 - 138	
1,1-Dichloroethene	8.0	U	80.0	77.3		ug/L	97	62 - 127	
1,2-Dichloropropane	8.0	U	80.0	95.0		ug/L	119	72 - 131	
cis-1,3-Dichloropropene	8.0	U	80.0	79.1		ug/L	99	68 - 120	
trans-1,3-Dichloropropene	8.0	U	80.0	78.0		ug/L	98	59 - 120	
Ethylbenzene	8.0	U	80.0	73.5		ug/L	92	72 - 121	
2-Hexanone	80	U	160	171		ug/L	107	21 - 184	
Methylene Chloride	40	U	80.0	103		ug/L	117	52 - 137	
4-Methyl-2-pentanone (MIBK)	80	U	160	195		ug/L	122	53 - 147	
Styrene	8.0	U	80.0	77.6		ug/L	97	74 - 125	
1,1,2,2-Tetrachloroethane	8.0	U	80.0	70.6		ug/L	88	51 - 123	
Tetrachloroethene	8.0	U	80.0	74.5		ug/L	85	69 - 126	
Toluene	8.0	U	80.0	78.8		ug/L	98	69 - 125	
Trichloroethene	19		80.0	94.1		ug/L	94	68 - 129	
Vinyl chloride	99		80.0	156		ug/L	72	55 - 123	
Xylenes, Total	16	U	160	149		ug/L	93	71 - 122	
1,1,1-Trichloroethane	8.0	U *	80.0	106		ug/L	132	57 - 156	
1,1,2-Trichloroethane	8.0	U	80.0	85.5		ug/L	107	68 - 127	

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# QC Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: 240-78922-3 MS**

**Matrix: Water**

**Analysis Batch: 278134**

**Client Sample ID: GW-18224-050117-DC-003**

**Prep Type: Total/NA**

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec.
	Result	Qualifier	Added	Result	Qualifier				
Cyclohexane	8.0	U	80.0	79.0		ug/L	99	56 - 135	
1,2-Dibromo-3-Chloropropane	8.0	U	80.0	58.5		ug/L	73	48 - 130	
1,2-Dibromoethane	8.0	U	80.0	82.0		ug/L	103	73 - 121	
Dichlorodifluoromethane	8.0	U	80.0	73.4		ug/L	92	45 - 130	
cis-1,2-Dichloroethene	260		80.0	319		ug/L	77	69 - 127	
trans-1,2-Dichloroethene	42		80.0	119		ug/L	97	66 - 131	
Isopropylbenzene	8.0	U	80.0	72.8		ug/L	91	70 - 132	
Methyl acetate	80	U	160	190		ug/L	119	52 - 139	
Methyl tert-butyl ether	8.0	U *	80.0	92.0		ug/L	115	67 - 125	
1,1,2-Trichloro-1,2,2-trifluoroethane	8.0	U	80.0	76.7		ug/L	96	58 - 137	
1,2,4-Trichlorobenzene	8.0	U F2	80.0	40.9		ug/L	51	26 - 138	
1,2-Dichlorobenzene	8.0	U	80.0	69.0		ug/L	86	70 - 120	
1,3-Dichlorobenzene	8.0	U	80.0	66.2		ug/L	83	71 - 120	
1,4-Dichlorobenzene	8.0	U	80.0	68.5		ug/L	86	72 - 120	
Trichlorofluoromethane	8.0	U *	80.0	115		ug/L	143	28 - 172	
Dibromochloromethane	8.0	U	80.0	85.6		ug/L	107	62 - 131	
Methylcyclohexane	8.0	U	80.0	66.4		ug/L	83	46 - 139	
<b>Surrogate</b>		<b>MS</b>	<b>MS</b>						
		<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>					
1,2-Dichloroethane-d4 (Surr)	109			61 - 138					
4-Bromofluorobenzene (Surr)	105			69 - 120					
Toluene-d8 (Surr)	103			73 - 120					
Dibromofluoromethane (Surr)	108			69 - 124					

**Lab Sample ID: 240-78922-3 MSD**

**Matrix: Water**

**Analysis Batch: 278134**

**Client Sample ID: GW-18224-050117-DC-003**

**Prep Type: Total/NA**

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	
	Result	Qualifier	Added	Result	Qualifier					
Acetone	80	U	160	133		ug/L	83	19 - 133	2	35
Benzene	8.0	U	80.0	91.0		ug/L	114	69 - 127	5	10
Bromodichloromethane	8.0	U	80.0	96.8		ug/L	121	75 - 128	2	13
Bromoform	8.0	U	80.0	73.7		ug/L	92	61 - 135	2	13
Bromomethane	8.0	U	80.0	57.3		ug/L	72	10 - 148	4	35
2-Butanone (MEK)	80	U	160	165		ug/L	103	34 - 153	2	23
Carbon disulfide	40	U	80.0	98.9		ug/L	124	46 - 143	6	18
Carbon tetrachloride	8.0	U	80.0	118		ug/L	147	53 - 175	9	17
Chlorobenzene	8.0	U	80.0	81.5		ug/L	102	76 - 120	6	12
Chloroethane	8.0	U	80.0	60.0		ug/L	75	10 - 141	1	35
Chloroform	8.0	U	80.0	96.1		ug/L	120	74 - 125	4	11
Chloromethane	8.0	U	80.0	61.8		ug/L	77	34 - 127	4	25
1,1-Dichloroethane	8.0	U	80.0	94.9		ug/L	119	69 - 122	4	11
1,2-Dichloroethane	8.0	U	80.0	93.4		ug/L	117	64 - 138	2	11
1,1,2-Dichloroethene	8.0	U	80.0	82.3		ug/L	103	62 - 127	6	14
1,2-Dichloropropane	8.0	U	80.0	100		ug/L	125	72 - 131	6	12
cis-1,3-Dichloropropene	8.0	U	80.0	83.5		ug/L	104	68 - 120	5	13
trans-1,3-Dichloropropene	8.0	U	80.0	81.9		ug/L	102	59 - 120	5	14

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# QC Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: 240-78922-3 MSD**

**Matrix: Water**

**Analysis Batch: 278134**

**Client Sample ID: GW-18224-050117-DC-003**

**Prep Type: Total/NA**

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec.		RPD	Limit
	Result	Qualifier	Added	Result	Qualifier			%Rec.	Limits		
Ethylbenzene	8.0	U	80.0	81.1		ug/L	101	72 - 121		10	15
2-Hexanone	80	U	160	169		ug/L	106	21 - 184		1	12
Methylene Chloride	40	U	80.0	106		ug/L	121	52 - 137		3	12
4-Methyl-2-pentanone (MIBK)	80	U	160	194		ug/L	121	53 - 147		0	16
Styrene	8.0	U	80.0	83.3		ug/L	104	74 - 125		7	14
1,1,2,2-Tetrachloroethane	8.0	U	80.0	73.1		ug/L	91	51 - 123		3	17
Tetrachloroethene	8.0	U	80.0	80.7		ug/L	93	69 - 126		8	18
Toluene	8.0	U	80.0	84.4		ug/L	105	69 - 125		7	14
Trichloroethene	19		80.0	100		ug/L	102	68 - 129		6	12
Vinyl chloride	99		80.0	159		ug/L	76	55 - 123		2	12
Xylenes, Total	16	U	160	160		ug/L	100	71 - 122		7	14
1,1,1-Trichloroethane	8.0	U *	80.0	116		ug/L	145	57 - 156		9	13
1,1,2-Trichloroethane	8.0	U	80.0	85.2		ug/L	107	68 - 127		0	11
Cyclohexane	8.0	U	80.0	88.1		ug/L	110	56 - 135		11	35
1,2-Dibromo-3-Chloropropane	8.0	U	80.0	65.1		ug/L	81	48 - 130		11	31
1,2-Dibromoethane	8.0	U	80.0	83.5		ug/L	104	73 - 121		2	12
Dichlorodifluoromethane	8.0	U	80.0	78.4		ug/L	98	45 - 130		7	34
cis-1,2-Dichloroethene	260		80.0	324	E	ug/L	83	69 - 127		2	11
trans-1,2-Dichloroethene	42		80.0	128		ug/L	108	66 - 131		7	11
Isopropylbenzene	8.0	U	80.0	79.8		ug/L	100	70 - 132		9	16
Methyl acetate	80	U	160	187		ug/L	117	52 - 139		2	14
Methyl tert-butyl ether	8.0	U *	80.0	95.2		ug/L	119	67 - 125		3	12
1,1,2-Trichloro-1,2,2-trifluoroethane	8.0	U	80.0	83.2		ug/L	104	58 - 137		8	35
1,2,4-Trichlorobenzene	8.0	U F2	80.0	59.2	F2	ug/L	74	26 - 138		37	35
1,2-Dichlorobenzene	8.0	U	80.0	78.0		ug/L	97	70 - 120		12	19
1,3-Dichlorobenzene	8.0	U	80.0	75.1		ug/L	94	71 - 120		13	18
1,4-Dichlorobenzene	8.0	U	80.0	75.7		ug/L	95	72 - 120		10	17
Trichlorofluoromethane	8.0	U *	80.0	122		ug/L	153	28 - 172		6	26
Dibromochloromethane	8.0	U	80.0	90.1		ug/L	113	62 - 131		5	15
Methylcyclohexane	8.0	U	80.0	75.2		ug/L	94	46 - 139		12	35

Surrogate	MSD	MSD	Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	105		61 - 138
4-Bromofluorobenzene (Surr)	106		69 - 120
Toluene-d8 (Surr)	103		73 - 120
Dibromofluoromethane (Surr)	110		69 - 124

**Lab Sample ID: MB 240-278328/6**

**Matrix: Water**

**Analysis Batch: 278328**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB	MB	RL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier						
Acetone	10	U	10	ug/L			05/10/17 12:09	1
Benzene	1.0	U	1.0	ug/L			05/10/17 12:09	1
Bromodichloromethane	1.0	U	1.0	ug/L			05/10/17 12:09	1
Bromoform	1.0	U	1.0	ug/L			05/10/17 12:09	1
Bromomethane	1.0	U	1.0	ug/L			05/10/17 12:09	1

TestAmerica Canton

# QC Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: MB 240-278328/6**

**Matrix: Water**

**Analysis Batch: 278328**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB	MB	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
2-Butanone (MEK)	10	U	10		10	ug/L		05/10/17 12:09		1
Carbon disulfide	5.0	U	5.0		5.0	ug/L		05/10/17 12:09		1
Carbon tetrachloride	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
Chlorobenzene	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
Chloroethane	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
Chloroform	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
Chloromethane	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
1,1-Dichloroethane	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
1,2-Dichloroethane	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
1,1-Dichloroethene	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
1,2-Dichloropropane	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
cis-1,3-Dichloropropene	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
trans-1,3-Dichloropropene	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
Ethylbenzene	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
2-Hexanone	10	U	10		10	ug/L		05/10/17 12:09		1
Methylene Chloride	5.0	U	5.0		5.0	ug/L		05/10/17 12:09		1
4-Methyl-2-pentanone (MIBK)	10	U	10		10	ug/L		05/10/17 12:09		1
Styrene	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
1,1,2,2-Tetrachloroethane	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
Tetrachloroethene	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
Toluene	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
Trichloroethene	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
Vinyl chloride	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
Xylenes, Total	2.0	U	2.0		2.0	ug/L		05/10/17 12:09		1
1,1,1-Trichloroethane	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
1,1,2-Trichloroethane	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
Cyclohexane	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
1,2-Dibromo-3-Chloropropane	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
1,2-Dibromoethane	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
Dichlorodifluoromethane	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
cis-1,2-Dichloroethene	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
trans-1,2-Dichloroethene	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
Isopropylbenzene	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
Methyl acetate	10	U	10		10	ug/L		05/10/17 12:09		1
Methyl tert-butyl ether	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
1,2,4-Trichlorobenzene	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
1,2-Dichlorobenzene	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
1,3-Dichlorobenzene	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
1,4-Dichlorobenzene	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
Trichlorofluoromethane	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
Dibromochloromethane	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1
Methylcyclohexane	1.0	U	1.0		1.0	ug/L		05/10/17 12:09		1

Surrogate	MB	MB	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
	Result	Qualifier						
1,2-Dichloroethane-d4 (Surr)	115		61 - 138				05/10/17 12:09	1
4-Bromofluorobenzene (Surr)	94		69 - 120				05/10/17 12:09	1
Toluene-d8 (Surr)	97		73 - 120				05/10/17 12:09	1

TestAmerica Canton

# QC Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: MB 240-278328/6**

**Matrix: Water**

**Analysis Batch: 278328**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Surrogate	MB	MB	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
	109	69 - 124						
Dibromofluoromethane (Surr)								

**Lab Sample ID: LCS 240-278328/4**

**Matrix: Water**

**Analysis Batch: 278328**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	20.0	16.4		ug/L	82	35 - 131	
Benzene	10.0	11.4		ug/L	114	79 - 120	
Bromodichloromethane	10.0	12.1		ug/L	121	79 - 125	
Bromoform	10.0	9.38		ug/L	94	55 - 145	
Bromomethane	10.0	7.05		ug/L	70	17 - 158	
2-Butanone (MEK)	20.0	21.5		ug/L	107	43 - 149	
Carbon disulfide	10.0	10.6		ug/L	106	49 - 141	
Carbon tetrachloride	10.0	15.7		ug/L	157	55 - 171	
Chlorobenzene	10.0	10.5		ug/L	105	80 - 120	
Chloroethane	10.0	6.55		ug/L	65	10 - 149	
Chloroform	10.0	11.6		ug/L	116	80 - 120	
Chloromethane	10.0	11.8		ug/L	118	59 - 124	
1,1-Dichloroethane	10.0	11.6		ug/L	116	74 - 120	
1,2-Dichloroethane	10.0	11.7		ug/L	117	68 - 133	
1,1-Dichloroethene	10.0	9.38		ug/L	94	65 - 127	
1,2-Dichloropropane	10.0	12.2		ug/L	122	78 - 127	
cis-1,3-Dichloropropene	10.0	11.2		ug/L	112	75 - 120	
trans-1,3-Dichloropropene	10.0	10.7		ug/L	107	67 - 120	
Ethylbenzene	10.0	10.5		ug/L	105	80 - 120	
2-Hexanone	20.0	23.9		ug/L	119	28 - 169	
Methylene Chloride	10.0	12.3		ug/L	123	64 - 140	
4-Methyl-2-pentanone (MIBK)	20.0	25.5		ug/L	127	53 - 144	
Styrene	10.0	10.8		ug/L	108	80 - 121	
1,1,2,2-Tetrachloroethane	10.0	8.62		ug/L	86	58 - 122	
Tetrachloroethene	10.0	10.1		ug/L	101	80 - 122	
Toluene	10.0	10.8		ug/L	108	78 - 120	
Trichloroethene	10.0	10.8		ug/L	108	76 - 124	
Vinyl chloride	10.0	10.5		ug/L	105	65 - 124	
Xylenes, Total	20.0	21.1		ug/L	106	80 - 120	
1,1,1-Trichloroethane	10.0	14.9 *		ug/L	149	64 - 147	
1,1,2-Trichloroethane	10.0	10.7		ug/L	107	76 - 121	
Cyclohexane	10.0	12.3		ug/L	123	66 - 135	
1,2-Dibromo-3-Chloropropane	10.0	8.36		ug/L	84	50 - 130	
1,2-Dibromoethane	10.0	10.3		ug/L	103	80 - 120	
Dichlorodifluoromethane	10.0	11.1		ug/L	111	42 - 141	
cis-1,2-Dichloroethene	10.0	11.3		ug/L	113	77 - 120	
trans-1,2-Dichloroethene	10.0	11.6		ug/L	116	74 - 124	
Isopropylbenzene	10.0	11.1		ug/L	111	80 - 128	
Methyl acetate	20.0	25.0		ug/L	125	63 - 137	
Methyl tert-butyl ether	10.0	12.2 *		ug/L	122	73 - 120	

TestAmerica Canton

# QC Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCS 240-278328/4**

**Matrix: Water**

**Analysis Batch: 278328**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike	LCS	LCS	Unit	D	%Rec.	%Limits				
	Added	Result	Qualifier			100					
1,1,2-Trichloro-1,2,2-trifluoroethane	10.0	10.0		ug/L		100	65 - 144				
1,2,4-Trichlorobenzene	10.0	8.53		ug/L		85	34 - 141				
1,2-Dichlorobenzene	10.0	9.79		ug/L		98	80 - 120				
1,3-Dichlorobenzene	10.0	9.55		ug/L		96	80 - 120				
1,4-Dichlorobenzene	10.0	9.62		ug/L		96	80 - 120				
Trichlorofluoromethane	10.0	16.8		ug/L		168	27 - 176				
Dibromochloromethane	10.0	11.2		ug/L		112	64 - 129				
Methylcyclohexane	10.0	10.6		ug/L		106	63 - 141				
<hr/>											
Surrogate	LCS	LCS	Limits								
	%Recovery	Qualifier									
1,2-Dichloroethane-d4 (Surr)	107		61 - 138								
4-Bromofluorobenzene (Surr)	105		69 - 120								
Toluene-d8 (Surr)	106		73 - 120								
Dibromofluoromethane (Surr)	111		69 - 124								

## Method: 8270C - Semivolatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 240-277475/20-A**

**Matrix: Water**

**Analysis Batch: 277930**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

**Prep Batch: 277475**

Analyte	MB	MB	RL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier						
1,1'-Biphenyl	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
2,2'-oxybis[1-chloropropane]	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
2,4,5-Trichlorophenol	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
2,4,6-Trichlorophenol	4.0	U	4.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
2,4-Dichlorophenol	10	U	10	ug/L	05/04/17 08:32	05/08/17 10:15		1
2,4-Dimethylphenol	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
2,4-Dinitrophenol	20	U	20	ug/L	05/04/17 08:32	05/08/17 10:15		1
2,4-Dinitrotoluene	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
2,6-Dinitrotoluene	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
2-Chloronaphthalene	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
2-Chlorophenol	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
2-Methylnaphthalene	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
2-Methylphenol	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
2-Nitroaniline	20	U	20	ug/L	05/04/17 08:32	05/08/17 10:15		1
2-Nitrophenol	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
3,3'-Dichlorobenzidine	1.0	U	1.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
3-Nitroaniline	20	U	20	ug/L	05/04/17 08:32	05/08/17 10:15		1
4,6-Dinitro-2-methylphenol	20	U	20	ug/L	05/04/17 08:32	05/08/17 10:15		1
4-Bromophenyl phenyl ether	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
4-Chloro-3-methylphenol	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
4-Chloroaniline	10	U	10	ug/L	05/04/17 08:32	05/08/17 10:15		1
4-Chlorophenyl phenyl ether	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
4-Nitroaniline	20	U	20	ug/L	05/04/17 08:32	05/08/17 10:15		1
4-Nitrophenol	20	U	20	ug/L	05/04/17 08:32	05/08/17 10:15		1
Acenaphthene	5.0	U	5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1

TestAmerica Canton

# QC Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: MB 240-277475/20-A**

**Matrix: Water**

**Analysis Batch: 277930**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

**Prep Batch: 277475**

Analyte	MB	MB	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier						Prepared	Analyzed	Dil Fac
Acenaphthylene	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Acetophenone	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Anthracene	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Atrazine	3.0	U	3.0		3.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Benzaldehyde	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Benzo[a]anthracene	1.0	U	1.0		1.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Benzo[a]pyrene	1.0	U	1.0		1.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Benzo[b]fluoranthene	1.0	U	1.0		1.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Benzo[g,h,i]perylene	1.0	U	1.0		1.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Benzo[k]fluoranthene	1.0	U	1.0		1.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Bis(2-chloroethoxy)methane	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Bis(2-chloroethyl)ether	1.0	U	1.0		1.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Bis(2-ethylhexyl) phthalate	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Butyl benzyl phthalate	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Caprolactam	10	U	10		10	ug/L	05/04/17 08:32	05/08/17 10:15		1
Carbazole	10	U	10		10	ug/L	05/04/17 08:32	05/08/17 10:15		1
Chrysene	1.0	U	1.0		1.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Dibenz(a,h)anthracene	2.0	U	2.0		2.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Dibenzofuran	4.0	U	4.0		4.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Diethyl phthalate	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Dimethyl phthalate	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Di-n-butyl phthalate	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Di-n-octyl phthalate	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Fluoranthene	1.0	U	1.0		1.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Fluorene	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Hexachlorobenzene	0.20	U	0.20		0.20	ug/L	05/04/17 08:32	05/08/17 10:15		1
Hexachlorobutadiene	1.0	U	1.0		1.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Hexachlorocyclopentadiene	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Hexachloroethane	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Indeno[1,2,3-cd]pyrene	2.0	U	2.0		2.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Isophorone	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Naphthalene	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Nitrobenzene	3.0	U	3.0		3.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
N-Nitrosodi-n-propylamine	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
N-Nitrosodiphenylamine	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Pentachlorophenol	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Phenol	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Phenanthrene	2.0	U	2.0		2.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
Pyrene	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1
3 & 4 Methylphenol	5.0	U	5.0		5.0	ug/L	05/04/17 08:32	05/08/17 10:15		1

Surrogate	MB	MB	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
	Result	Qualifier						
2-Fluorobiphenyl (Surr)	89		42 - 120			05/04/17 08:32	05/08/17 10:15	1
2-Fluorophenol (Surr)	54		10 - 120			05/04/17 08:32	05/08/17 10:15	1
2,4,6-Tribromophenol (Surr)	77		35 - 125			05/04/17 08:32	05/08/17 10:15	1
Nitrobenzene-d5 (Surr)	91		36 - 120			05/04/17 08:32	05/08/17 10:15	1
Phenol-d5 (Surr)	35		10 - 120			05/04/17 08:32	05/08/17 10:15	1
Terphenyl-d14 (Surr)	102		17 - 120			05/04/17 08:32	05/08/17 10:15	1

TestAmerica Canton

# QC Sample Results

Client: GHD Services Inc.  
Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Lab Sample ID: LCS 240-277475/21-A**  
**Matrix: Water**  
**Analysis Batch: 277930**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 277475**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.	Limits
1,1'-Biphenyl	20.0	17.0		ug/L		85	58 - 120	
2,2'-oxybis[1-chloropropane]	20.0	20.7		ug/L		103	46 - 120	
2,4,5-Trichlorophenol	20.0	17.6		ug/L		88	57 - 120	
2,4,6-Trichlorophenol	20.0	17.3		ug/L		86	60 - 120	
2,4-Dichlorophenol	20.0	17.6		ug/L		88	57 - 120	
2,4-Dimethylphenol	20.0	18.4		ug/L		92	55 - 120	
2,4-Dinitrophenol	40.0	22.4		ug/L		56	18 - 127	
2,4-Dinitrotoluene	20.0	18.1		ug/L		90	65 - 120	
2,6-Dinitrotoluene	20.0	17.7		ug/L		89	65 - 120	
2-Chloronaphthalene	20.0	16.8		ug/L		84	56 - 120	
2-Chlorophenol	20.0	16.0		ug/L		80	57 - 120	
2-Methylnaphthalene	20.0	18.1		ug/L		90	58 - 120	
2-Methylphenol	20.0	14.0		ug/L		70	52 - 120	
2-Nitroaniline	20.0	20.1		ug/L		101	56 - 123	
2-Nitrophenol	20.0	17.5		ug/L		87	62 - 120	
3,3'-Dichlorobenzidine	40.0	36.2		ug/L		91	10 - 134	
3-Nitroaniline	20.0	15.8 J		ug/L		79	36 - 120	
4,6-Dinitro-2-methylphenol	40.0	31.6		ug/L		79	35 - 140	
4-Bromophenyl phenyl ether	20.0	18.5		ug/L		93	52 - 128	
4-Chloro-3-methylphenol	20.0	18.6		ug/L		93	59 - 120	
4-Chloroaniline	20.0	3.93 J		ug/L		20	10 - 120	
4-Chlorophenyl phenyl ether	20.0	17.8		ug/L		89	58 - 120	
4-Nitroaniline	20.0	18.7 J		ug/L		94	51 - 122	
4-Nitrophenol	40.0	15.1 J		ug/L		38	16 - 120	
Acenaphthene	20.0	17.8		ug/L		89	57 - 120	
Acenaphthylene	20.0	17.3		ug/L		86	55 - 120	
Acetophenone	20.0	18.3		ug/L		92	60 - 120	
Anthracene	20.0	18.2		ug/L		91	58 - 120	
Atrazine	40.0	40.1		ug/L		100	61 - 132	
Benzaldehyde	40.0	39.9		ug/L		100	60 - 120	
Benzo[a]anthracene	20.0	16.6		ug/L		83	59 - 120	
Benzo[a]pyrene	20.0	18.1		ug/L		90	60 - 120	
Benzo[b]fluoranthene	20.0	18.8		ug/L		94	62 - 120	
Benzo[g,h,i]perylene	20.0	17.1		ug/L		85	59 - 120	
Benzo[k]fluoranthene	20.0	17.7		ug/L		88	57 - 120	
Bis(2-chloroethoxy)methane	20.0	18.4		ug/L		92	61 - 120	
Bis(2-chloroethyl)ether	20.0	16.5		ug/L		82	55 - 120	
Bis(2-ethylhexyl) phthalate	20.0	17.7		ug/L		88	62 - 123	
Butyl benzyl phthalate	20.0	18.8		ug/L		94	61 - 120	
Caprolactam	40.0	5.90 J		ug/L		15	10 - 120	
Carbazole	20.0	18.4		ug/L		92	60 - 126	
Chrysene	20.0	15.7		ug/L		79	61 - 120	
Dibenz(a,h)anthracene	20.0	17.0		ug/L		85	61 - 120	
Dibenzofuran	20.0	17.2		ug/L		86	58 - 120	
Diethyl phthalate	20.0	20.7		ug/L		103	62 - 120	
Dimethyl phthalate	20.0	18.9		ug/L		94	62 - 120	
Di-n-butyl phthalate	20.0	19.0		ug/L		95	59 - 128	
Di-n-octyl phthalate	20.0	18.1		ug/L		91	58 - 120	
Fluoranthene	20.0	18.5		ug/L		92	57 - 123	
Fluorene	20.0	17.7		ug/L		88	56 - 120	

TestAmerica Canton

# QC Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCS 240-277475/21-A**

**Matrix: Water**

**Analysis Batch: 277930**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

**Prep Batch: 277475**

**%Rec.**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Hexachlorobenzene	20.0	17.9		ug/L	90	47 - 127	
Hexachlorobutadiene	20.0	17.2		ug/L	86	50 - 120	
Hexachlorocyclopentadiene	20.0	9.66		ug/L	48	25 - 120	
Hexachloroethane	20.0	16.7		ug/L	84	50 - 120	
Indeno[1,2,3-cd]pyrene	20.0	18.1		ug/L	90	61 - 120	
Isophorone	20.0	18.5		ug/L	93	61 - 120	
Naphthalene	20.0	17.4		ug/L	87	54 - 120	
Nitrobenzene	20.0	19.2		ug/L	96	58 - 120	
N-Nitrosodi-n-propylamine	20.0	18.5		ug/L	93	60 - 120	
N-Nitrosodiphenylamine	20.0	18.6		ug/L	93	54 - 122	
Pentachlorophenol	40.0	27.2		ug/L	68	35 - 121	
Phenol	20.0	6.13		ug/L	31	16 - 120	
Phenanthrene	20.0	17.9		ug/L	89	58 - 120	
Pyrene	20.0	18.1		ug/L	90	60 - 120	
3 & 4 Methylphenol	20.0	12.7		ug/L	64	46 - 120	

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorobiphenyl (Surr)	96		42 - 120
2-Fluorophenol (Surr)	52		10 - 120
2,4,6-Tribromophenol (Surr)	90		35 - 125
Nitrobenzene-d5 (Surr)	101		36 - 120
Phenol-d5 (Surr)	34		10 - 120
Terphenyl-d14 (Surr)	97		17 - 120

**Lab Sample ID: MB 240-277477/20-A**

**Matrix: Water**

**Analysis Batch: 277889**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

**Prep Batch: 277477**

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
2,2'-oxybis[1-chloropropane]	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
2,4,5-Trichlorophenol	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
2,4,6-Trichlorophenol	4.0	U	4.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
2,4-Dichlorophenol	10	U	10	ug/L	05/04/17 08:36	05/08/17 07:10		1
2,4-Dimethylphenol	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
2,4-Dinitrophenol	20	U	20	ug/L	05/04/17 08:36	05/08/17 07:10		1
2,4-Dinitrotoluene	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
2,6-Dinitrotoluene	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
2-Chloronaphthalene	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
2-Chlorophenol	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
2-Methylnaphthalene	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
2-Methylphenol	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
2-Nitroaniline	20	U	20	ug/L	05/04/17 08:36	05/08/17 07:10		1
2-Nitrophenol	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
3,3'-Dichlorobenzidine	1.0	U	1.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
3-Nitroaniline	20	U	20	ug/L	05/04/17 08:36	05/08/17 07:10		1
4,6-Dinitro-2-methylphenol	20	U	20	ug/L	05/04/17 08:36	05/08/17 07:10		1
4-Bromophenyl phenyl ether	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1

TestAmerica Canton

# QC Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: MB 240-277477/20-A**

**Matrix: Water**

**Analysis Batch: 277889**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

**Prep Batch: 277477**

Analyte	MB		RL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier						
4-Chloro-3-methylphenol	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
4-Chloroaniline	10	U	10	ug/L	05/04/17 08:36	05/08/17 07:10		1
4-Chlorophenyl phenyl ether	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
4-Nitroaniline	20	U	20	ug/L	05/04/17 08:36	05/08/17 07:10		1
4-Nitrophenol	20	U	20	ug/L	05/04/17 08:36	05/08/17 07:10		1
Acenaphthene	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Acenaphthylene	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Acetophenone	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Anthracene	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Atrazine	3.0	U	3.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Benzaldehyde	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Benzo[a]anthracene	1.0	U	1.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Benzo[a]pyrene	1.0	U	1.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Benzo[b]fluoranthene	1.0	U	1.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Benzo[g,h,i]perylene	1.0	U	1.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Benzo[k]fluoranthene	1.0	U	1.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Bis(2-chloroethoxy)methane	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Bis(2-chloroethyl)ether	1.0	U	1.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Bis(2-ethylhexyl) phthalate	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Butyl benzyl phthalate	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Caprolactam	10	U	10	ug/L	05/04/17 08:36	05/08/17 07:10		1
Carbazole	10	U	10	ug/L	05/04/17 08:36	05/08/17 07:10		1
Chrysene	1.0	U	1.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Dibenz(a,h)anthracene	2.0	U	2.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Dibenzofuran	4.0	U	4.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Diethyl phthalate	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Dimethyl phthalate	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Di-n-butyl phthalate	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Di-n-octyl phthalate	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Fluoranthene	1.0	U	1.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Fluorene	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Hexachlorobenzene	0.20	U	0.20	ug/L	05/04/17 08:36	05/08/17 07:10		1
Hexachlorobutadiene	1.0	U	1.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Hexachlorocyclopentadiene	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Hexachloroethane	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Indeno[1,2,3-cd]pyrene	2.0	U	2.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Isophorone	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Naphthalene	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Nitrobenzene	3.0	U	3.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
N-Nitrosodi-n-propylamine	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
N-Nitrosodiphenylamine	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Pentachlorophenol	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Phenol	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Phenanthrene	2.0	U	2.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
Pyrene	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1
3 & 4 Methylphenol	5.0	U	5.0	ug/L	05/04/17 08:36	05/08/17 07:10		1

TestAmerica Canton

# QC Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID:** MB 240-277477/20-A

**Matrix:** Water

**Analysis Batch:** 277889

**Client Sample ID:** Method Blank

**Prep Type:** Total/NA

**Prep Batch:** 277477

Surrogate	MB	MB	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)		82			42 - 120	05/04/17 08:36	05/08/17 07:10	1
2-Fluorophenol (Surr)		50			10 - 120	05/04/17 08:36	05/08/17 07:10	1
2,4,6-Tribromophenol (Surr)		69			35 - 125	05/04/17 08:36	05/08/17 07:10	1
Nitrobenzene-d5 (Surr)		80			36 - 120	05/04/17 08:36	05/08/17 07:10	1
Phenol-d5 (Surr)		32			10 - 120	05/04/17 08:36	05/08/17 07:10	1
Terphenyl-d14 (Surr)		79			17 - 120	05/04/17 08:36	05/08/17 07:10	1

**Lab Sample ID:** LCS 240-277477/21-A

**Matrix:** Water

**Analysis Batch:** 277889

**Client Sample ID:** Lab Control Sample

**Prep Type:** Total/NA

**Prep Batch:** 277477

Analyte	Spike	LCS	LCS	Unit	D	%Rec	Limits	%Rec.
	Added	Result	Qualifier					
1,1'-Biphenyl	20.0	16.3		ug/L		81	58 - 120	
2,2'-oxybis[1-chloropropane]	20.0	14.1		ug/L		71	46 - 120	
2,4,5-Trichlorophenol	20.0	18.2		ug/L		91	57 - 120	
2,4,6-Trichlorophenol	20.0	17.5		ug/L		88	60 - 120	
2,4-Dichlorophenol	20.0	17.6		ug/L		88	57 - 120	
2,4-Dimethylphenol	20.0	17.0		ug/L		85	55 - 120	
2,4-Dinitrophenol	40.0	29.5		ug/L		74	18 - 127	
2,4-Dinitrotoluene	20.0	18.0		ug/L		90	65 - 120	
2,6-Dinitrotoluene	20.0	17.8		ug/L		89	65 - 120	
2-Chloronaphthalene	20.0	16.2		ug/L		81	56 - 120	
2-Chlorophenol	20.0	16.0		ug/L		80	57 - 120	
2-Methylnaphthalene	20.0	17.2		ug/L		86	58 - 120	
2-Methylphenol	20.0	13.9		ug/L		69	52 - 120	
2-Nitroaniline	20.0	16.9 J		ug/L		85	56 - 123	
2-Nitrophenol	20.0	17.6		ug/L		88	62 - 120	
3,3'-Dichlorobenzidine	40.0	32.6		ug/L		82	10 - 134	
3-Nitroaniline	20.0	15.8 J		ug/L		79	36 - 120	
4,6-Dinitro-2-methylphenol	40.0	34.2		ug/L		85	35 - 140	
4-Bromophenyl phenyl ether	20.0	19.1		ug/L		95	52 - 128	
4-Chloro-3-methylphenol	20.0	17.2		ug/L		86	59 - 120	
4-Chloroaniline	20.0	4.20 J		ug/L		21	10 - 120	
4-Chlorophenyl phenyl ether	20.0	16.7		ug/L		83	58 - 120	
4-Nitroaniline	20.0	16.5 J		ug/L		83	51 - 122	
4-Nitrophenol	40.0	15.2 J		ug/L		38	16 - 120	
Acenaphthene	20.0	16.9		ug/L		85	57 - 120	
Acenaphthylene	20.0	16.7		ug/L		83	55 - 120	
Acetophenone	20.0	16.3		ug/L		82	60 - 120	
Anthracene	20.0	18.2		ug/L		91	58 - 120	
Atrazine	40.0	40.5		ug/L		101	61 - 132	
Benzaldehyde	40.0	34.5		ug/L		86	60 - 120	
Benzo[a]anthracene	20.0	16.0		ug/L		80	59 - 120	
Benzo[a]pyrene	20.0	17.0		ug/L		85	60 - 120	
Benzo[b]fluoranthene	20.0	16.9		ug/L		84	62 - 120	
Benzo[g,h,i]perylene	20.0	17.0		ug/L		85	59 - 120	
Benzo[k]fluoranthene	20.0	16.3		ug/L		81	57 - 120	
Bis(2-chloroethoxy)methane	20.0	16.0		ug/L		80	61 - 120	

TestAmerica Canton

# QC Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCS 240-277477/21-A**

**Matrix: Water**

**Analysis Batch: 277889**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

**Prep Batch: 277477**

**%Rec.**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Bis(2-chloroethyl)ether	20.0	14.8		ug/L	74	55 - 120	
Bis(2-ethylhexyl) phthalate	20.0	14.4		ug/L	72	62 - 123	
Butyl benzyl phthalate	20.0	16.1		ug/L	80	61 - 120	
Caprolactam	40.0	5.84	J	ug/L	15	10 - 120	
Carbazole	20.0	17.7		ug/L	89	60 - 126	
Chrysene	20.0	15.6		ug/L	78	61 - 120	
Dibenz(a,h)anthracene	20.0	15.2		ug/L	76	61 - 120	
Dibenzofuran	20.0	16.8		ug/L	84	58 - 120	
Diethyl phthalate	20.0	16.9		ug/L	85	62 - 120	
Dimethyl phthalate	20.0	17.4		ug/L	87	62 - 120	
Di-n-butyl phthalate	20.0	17.1		ug/L	85	59 - 128	
Di-n-octyl phthalate	20.0	13.9		ug/L	70	58 - 120	
Fluoranthene	20.0	18.9		ug/L	94	57 - 123	
Fluorene	20.0	17.1		ug/L	85	56 - 120	
Hexachlorobenzene	20.0	18.7		ug/L	93	47 - 127	
Hexachlorobutadiene	20.0	17.1		ug/L	86	50 - 120	
Hexachlorocyclopentadiene	20.0	15.4		ug/L	77	25 - 120	
Hexachloroethane	20.0	15.7		ug/L	78	50 - 120	
Indeno[1,2,3-cd]pyrene	20.0	15.0		ug/L	75	61 - 120	
Isophorone	20.0	16.6		ug/L	83	61 - 120	
Naphthalene	20.0	16.3		ug/L	81	54 - 120	
Nitrobenzene	20.0	16.7		ug/L	83	58 - 120	
N-Nitrosodi-n-propylamine	20.0	16.3		ug/L	82	60 - 120	
N-Nitrosodiphenylamine	20.0	19.0		ug/L	95	54 - 122	
Pentachlorophenol	40.0	29.9		ug/L	75	35 - 121	
Phenol	20.0	6.24		ug/L	31	16 - 120	
Phenanthrene	20.0	17.4		ug/L	87	58 - 120	
Pyrene	20.0	16.3		ug/L	81	60 - 120	
3 & 4 Methylphenol	20.0	12.6		ug/L	63	46 - 120	

**LCS LCS**

Surrogate	%Recovery	Qualifier	Limits
2-Fluorobiphenyl (Surr)	88		42 - 120
2-Fluorophenol (Surr)	54		10 - 120
2,4,6-Tribromophenol (Surr)	86		35 - 125
Nitrobenzene-d5 (Surr)	94		36 - 120
Phenol-d5 (Surr)	35		10 - 120
Terphenyl-d14 (Surr)	85		17 - 120

**Lab Sample ID: 240-78922-3 MS**

**Matrix: Water**

**Analysis Batch: 277889**

**Client Sample ID: GW-18224-050117-DC-003**

**Prep Type: Total/NA**

**Prep Batch: 277477**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
1,1'-Biphenyl	5.3	U	20.4	16.5		ug/L	81	45 - 120	
2,2'-oxybis[1-chloropropane]	5.3	U	20.4	14.6		ug/L	72	39 - 120	
2,4,5-Trichlorophenol	5.3	U	20.4	19.3		ug/L	94	49 - 120	
2,4,6-Trichlorophenol	4.3	U	20.4	18.6		ug/L	91	51 - 120	
2,4-Dichlorophenol	11	U	20.4	18.4		ug/L	90	44 - 120	

TestAmerica Canton

# QC Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-78922-3 MS

Matrix: Water

Analysis Batch: 277889

Client Sample ID: GW-18224-050117-DC-003

Prep Type: Total/NA

Prep Batch: 277477

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	Limits	
	Result	Qualifier	Added	Result	Qualifier					
2,4-Dimethylphenol	5.3	U	20.4	18.0		ug/L	88	38 - 120		
2,4-Dinitrophenol	21	U	40.8	37.5		ug/L	92	10 - 122		
2,4-Dinitrotoluene	5.3	U	20.4	18.6		ug/L	91	50 - 120		
2,6-Dinitrotoluene	5.3	U	20.4	19.3		ug/L	95	54 - 120		
2-Chloronaphthalene	5.3	U	20.4	18.3		ug/L	90	43 - 120		
2-Chlorophenol	5.3	U	20.4	16.0		ug/L	78	43 - 120		
2-Methylnaphthalene	5.3	U	20.4	18.1		ug/L	89	42 - 120		
2-Methylphenol	5.3	U	20.4	13.3		ug/L	65	34 - 120		
2-Nitroaniline	21	U	20.4	20	U	ug/L	88	49 - 120		
2-Nitrophenol	5.3	U	20.4	18.5		ug/L	91	47 - 120		
3,3'-Dichlorobenzidine	1.1	U	40.8	19.3		ug/L	47	10 - 120		
3-Nitroaniline	21	U	20.4	20	U	ug/L	54	10 - 120		
4,6-Dinitro-2-methylphenol	21	U	40.8	39.5		ug/L	97	10 - 135		
4-Bromophenyl phenyl ether	5.3	U	20.4	19.6		ug/L	96	32 - 120		
4-Chloro-3-methylphenol	5.3	U	20.4	18.5		ug/L	90	49 - 120		
4-Chloroaniline	11	U	20.4	10	U	ug/L	19	10 - 120		
4-Chlorophenyl phenyl ether	5.3	U	20.4	17.3		ug/L	85	41 - 120		
4-Nitroaniline	21	U	20.4	20	U	ug/L	61	29 - 120		
4-Nitrophenol	21	U	40.8	20	U	ug/L	36	10 - 120		
Acenaphthene	5.3	U	20.4	17.5		ug/L	86	37 - 120		
Acenaphthylene	5.3	U	20.4	17.2		ug/L	84	40 - 120		
Acetophenone	5.3	U	20.4	16.3		ug/L	80	43 - 120		
Anthracene	5.3	U	20.4	19.1		ug/L	94	36 - 120		
Atrazine	3.2	U	40.8	43.1		ug/L	105	50 - 122		
Benzaldehyde	5.3	U	40.8	32.4		ug/L	79	42 - 120		
Benzo[a]anthracene	1.1	U	20.4	15.1		ug/L	74	18 - 120		
Benzo[a]pyrene	1.1	U	20.4	15.3		ug/L	75	13 - 120		
Benzo[b]fluoranthene	1.1	U	20.4	15.1		ug/L	74	14 - 120		
Benzo[g,h,i]perylene	1.1	U	20.4	15.7		ug/L	77	10 - 120		
Benzo[k]fluoranthene	1.1	U	20.4	14.7		ug/L	72	13 - 120		
Bis(2-chloroethoxy)methane	5.3	U	20.4	16.8		ug/L	82	50 - 120		
Bis(2-chloroethyl)ether	1.1	U	20.4	14.9		ug/L	73	45 - 120		
Bis(2-ethylhexyl) phthalate	5.3	U	20.4	13.2		ug/L	65	10 - 120		
Butyl benzyl phthalate	5.3	U	20.4	17.1		ug/L	84	28 - 120		
Caprolactam	11	U	40.8	10	U	ug/L	12	10 - 120		
Carbazole	11	U	20.4	20.0		ug/L	98	55 - 120		
Chrysene	1.1	U	20.4	14.4		ug/L	70	17 - 120		
Dibenz(a,h)anthracene	2.1	U	20.4	13.6		ug/L	67	10 - 120		
Dibenzofuran	4.3	U	20.4	17.2		ug/L	84	44 - 120		
Diethyl phthalate	5.3	U	20.4	16.0		ug/L	79	51 - 120		
Dimethyl phthalate	5.3	U	20.4	18.0		ug/L	88	54 - 120		
Di-n-butyl phthalate	5.3	U	20.4	19.8		ug/L	97	34 - 120		
Di-n-octyl phthalate	5.3	U	20.4	12.5		ug/L	61	10 - 120		
Fluoranthene	1.1	U	20.4	20.6		ug/L	101	28 - 120		
Fluorene	5.3	U	20.4	17.5		ug/L	86	38 - 120		
Hexachlorobenzene	0.21	U	20.4	18.9		ug/L	92	17 - 120		
Hexachlorobutadiene	1.1	U	20.4	16.4		ug/L	80	32 - 120		
Hexachlorocyclopentadiene	5.3	U	20.4	16.3		ug/L	80	10 - 120		

TestAmerica Canton

# QC Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: 240-78922-3 MS**

**Matrix: Water**

**Analysis Batch: 277889**

**Client Sample ID: GW-18224-050117-DC-003**

**Prep Type: Total/NA**

**Prep Batch: 277477**

**%Rec.**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Hexachloroethane	5.3	U	20.4	14.9		ug/L	73	10 - 120	
Indeno[1,2,3-cd]pyrene	2.1	U	20.4	13.4		ug/L	66	10 - 120	
Isophorone	5.3	U	20.4	17.4		ug/L	85	52 - 120	
Naphthalene	5.3	U	20.4	16.7		ug/L	82	37 - 120	
Nitrobenzene	3.2	U	20.4	17.5		ug/L	86	47 - 120	
N-Nitrosodi-n-propylamine	5.3	U	20.4	16.7		ug/L	82	49 - 120	
N-Nitrosodiphenylamine	5.3	U	20.4	17.8		ug/L	87	46 - 120	
Pentachlorophenol	5.3	U	40.8	37.5		ug/L	87	32 - 120	
Phenol	5.3	U	20.4	5.78		ug/L	28	10 - 120	
Phenanthrene	2.1	U	20.4	18.0		ug/L	88	38 - 120	
Pyrene	5.3	U	20.4	17.7		ug/L	87	26 - 120	
3 & 4 Methylphenol	5.3	U	20.4	12.2		ug/L	60	26 - 120	

**MS MS**

Surrogate	MS %Recovery	MS Qualifier	MS Limits
2-Fluorobiphenyl (Surr)	88		42 - 120
2-Fluorophenol (Surr)	50		10 - 120
2,4,6-Tribromophenol (Surr)	91		35 - 125
Nitrobenzene-d5 (Surr)	96		36 - 120
Phenol-d5 (Surr)	30		10 - 120
Terphenyl-d14 (Surr)	73		17 - 120

**Lab Sample ID: 240-78922-3 MSD**

**Matrix: Water**

**Analysis Batch: 277889**

**Client Sample ID: GW-18224-050117-DC-003**

**Prep Type: Total/NA**

**Prep Batch: 277477**

**%Rec.**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	RPD	RPD Limit
1,1'-Biphenyl	5.3	U	19.2	15.9		ug/L	83	45 - 120	4	26
2,2'-oxybis[1-chloropropane]	5.3	U	19.2	14.3		ug/L	74	39 - 120	2	27
2,4,5-Trichlorophenol	5.3	U	19.2	18.8		ug/L	98	49 - 120	2	24
2,4,6-Trichlorophenol	4.3	U	19.2	17.9		ug/L	93	51 - 120	4	22
2,4-Dichlorophenol	11	U	19.2	17.2		ug/L	90	44 - 120	6	25
2,4-Dimethylphenol	5.3	U	19.2	17.1		ug/L	89	38 - 120	5	28
2,4-Dinitrophenol	21	U	38.5	36.0		ug/L	94	10 - 122	4	35
2,4-Dinitrotoluene	5.3	U	19.2	18.1		ug/L	94	50 - 120	3	24
2,6-Dinitrotoluene	5.3	U	19.2	18.3		ug/L	95	54 - 120	5	22
2-Chloronaphthalene	5.3	U	19.2	17.9		ug/L	93	43 - 120	2	26
2-Chlorophenol	5.3	U	19.2	15.3		ug/L	80	43 - 120	5	27
2-Methylnaphthalene	5.3	U	19.2	16.9		ug/L	88	42 - 120	7	35
2-Methylphenol	5.3	U	19.2	12.8		ug/L	67	34 - 120	4	27
2-Nitroaniline	21	U	19.2	19	U	ug/L	91	49 - 120	2	30
2-Nitrophenol	5.3	U	19.2	17.5		ug/L	91	47 - 120	6	27
3,3'-Dichlorobenzidine	1.1	U	38.5	19.5		ug/L	51	10 - 120	1	35
3-Nitroaniline	21	U	19.2	19	U	ug/L	62	10 - 120	7	35
4,6-Dinitro-2-methylphenol	21	U	38.5	37.9		ug/L	99	10 - 135	4	35
4-Bromophenyl phenyl ether	5.3	U	19.2	18.3		ug/L	95	32 - 120	7	27
4-Chloro-3-methylphenol	5.3	U	19.2	17.5		ug/L	91	49 - 120	5	24
4-Chloroaniline	11	U	19.2	9.6	U	ug/L	27	10 - 120	31	35
4-Chlorophenyl phenyl ether	5.3	U	19.2	16.4		ug/L	85	41 - 120	6	28

TestAmerica Canton

# QC Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: 240-78922-3 MSD**

**Matrix: Water**

**Analysis Batch: 277889**

**Client Sample ID: GW-18224-050117-DC-003**

**Prep Type: Total/NA**

**Prep Batch: 277477**

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	Limits	RPD	Limit
	Result	Qualifier	Added	Result	Qualifier						
4-Nitroaniline	21	U	19.2	19	U	ug/L	66	29 - 120	1	34	
4-Nitrophenol	21	U	38.5	19	U	ug/L	34	10 - 120	12	35	
Acenaphthene	5.3	U	19.2	16.8		ug/L	87	37 - 120	4	35	
Acenaphthylene	5.3	U	19.2	16.4		ug/L	85	40 - 120	4	31	
Acetophenone	5.3	U	19.2	16.0		ug/L	83	43 - 120	2	30	
Anthracene	5.3	U	19.2	18.0		ug/L	94	36 - 120	6	35	
Atrazine	3.2	U	38.5	41.8		ug/L	109	50 - 122	3	25	
Benzaldehyde	5.3	U	38.5	32.2		ug/L	84	42 - 120	1	32	
Benzo[a]anthracene	1.1	U	19.2	14.2		ug/L	74	18 - 120	6	35	
Benzo[a]pyrene	1.1	U	19.2	14.0		ug/L	73	13 - 120	8	35	
Benzo[b]fluoranthene	1.1	U	19.2	13.7		ug/L	71	14 - 120	9	35	
Benzo[g,h,i]perylene	1.1	U	19.2	14.3		ug/L	74	10 - 120	10	35	
Benzo[k]fluoranthene	1.1	U	19.2	13.6		ug/L	71	13 - 120	8	35	
Bis(2-chloroethoxy)methane	5.3	U	19.2	15.8		ug/L	82	50 - 120	6	26	
Bis(2-chloroethyl)ether	1.1	U	19.2	14.4		ug/L	75	45 - 120	3	28	
Bis(2-ethylhexyl) phthalate	5.3	U	19.2	12.0		ug/L	63	10 - 120	9	29	
Butyl benzyl phthalate	5.3	U	19.2	16.2		ug/L	84	28 - 120	5	29	
Caprolactam	11	U	38.5	9.6	U	ug/L	11	10 - 120	15	35	
Carbazole	11	U	19.2	19.1		ug/L	99	55 - 120	5	21	
Chrysene	1.1	U	19.2	13.7		ug/L	71	17 - 120	5	35	
Dibenz(a,h)anthracene	2.1	U	19.2	12.3		ug/L	64	10 - 120	11	35	
Dibenzofuran	4.3	U	19.2	16.7		ug/L	87	44 - 120	3	23	
Diethyl phthalate	5.3	U	19.2	15.9		ug/L	83	51 - 120	1	21	
Dimethyl phthalate	5.3	U	19.2	17.6		ug/L	91	54 - 120	3	22	
Di-n-butyl phthalate	5.3	U	19.2	18.7		ug/L	97	34 - 120	6	26	
Di-n-octyl phthalate	5.3	U	19.2	11.3		ug/L	59	10 - 120	10	35	
Fluoranthene	1.1	U	19.2	19.5		ug/L	102	28 - 120	5	35	
Fluorene	5.3	U	19.2	17.0		ug/L	89	38 - 120	3	32	
Hexachlorobenzene	0.21	U	19.2	18.1		ug/L	94	17 - 120	4	35	
Hexachlorobutadiene	1.1	U	19.2	15.1		ug/L	79	32 - 120	8	35	
Hexachlorocyclopentadiene	5.3	U	19.2	15.2		ug/L	79	10 - 120	7	35	
Hexachloroethane	5.3	U	19.2	14.7		ug/L	77	10 - 120	1	35	
Indeno[1,2,3-cd]pyrene	2.1	U	19.2	12.5		ug/L	65	10 - 120	8	35	
Isophorone	5.3	U	19.2	16.3		ug/L	85	52 - 120	6	26	
Naphthalene	5.3	U	19.2	15.6		ug/L	81	37 - 120	7	33	
Nitrobenzene	3.2	U	19.2	16.2		ug/L	84	47 - 120	7	25	
N-Nitrosodi-n-propylamine	5.3	U	19.2	16.3		ug/L	85	49 - 120	3	26	
N-Nitrosodiphenylamine	5.3	U	19.2	17.4		ug/L	90	46 - 120	2	23	
Pentachlorophenol	5.3	U	38.5	34.4		ug/L	84	32 - 120	9	26	
Phenol	5.3	U	19.2	5.13		ug/L	27	10 - 120	12	35	
Phenanthrene	2.1	U	19.2	17.2		ug/L	89	38 - 120	5	35	
Pyrene	5.3	U	19.2	16.8		ug/L	88	26 - 120	5	35	
3 & 4 Methylphenol	5.3	U	19.2	11.4		ug/L	59	26 - 120	7	23	

Surrogate	MSD	MSD	Limits
	%Recovery	Qualifier	
2-Fluorobiphenyl (Surr)	91		42 - 120
2-Fluorophenol (Surr)	47		10 - 120
2,4,6-Tribromophenol (Surr)	93		35 - 125

TestAmerica Canton

# QC Sample Results

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-78922-3 MSD

Matrix: Water

Analysis Batch: 277889

Client Sample ID: GW-18224-050117-DC-003

Prep Type: Total/NA

Prep Batch: 277477

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Nitrobenzene-d5 (Surr)	97		36 - 120
Phenol-d5 (Surr)	29		10 - 120
Terphenyl-d14 (Surr)	72		17 - 120

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# QC Association Summary

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## GC/MS VOA

### Analysis Batch: 278134

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-78922-1	GW-18224-050117-DC-001	Total/NA	Water	8260B	
240-78922-2	GW-18224-050117-DC-002	Total/NA	Water	8260B	
240-78922-3	GW-18224-050117-DC-003	Total/NA	Water	8260B	
240-78922-4	GW-18224-050117-DC-004	Total/NA	Water	8260B	
240-78922-5	GW-18224-050117-DC-005	Total/NA	Water	8260B	
240-78922-7	TB-18224-050117	Total/NA	Water	8260B	
MB 240-278134/6	Method Blank	Total/NA	Water	8260B	
LCS 240-278134/4	Lab Control Sample	Total/NA	Water	8260B	
240-78922-3 MS	GW-18224-050117-DC-003	Total/NA	Water	8260B	
240-78922-3 MSD	GW-18224-050117-DC-003	Total/NA	Water	8260B	

### Analysis Batch: 278328

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-78922-6	GW-18224-050117-DC-006	Total/NA	Water	8260B	
MB 240-278328/6	Method Blank	Total/NA	Water	8260B	
LCS 240-278328/4	Lab Control Sample	Total/NA	Water	8260B	

## GC/MS Semi VOA

### Prep Batch: 277475

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-78922-4	GW-18224-050117-DC-004	Total/NA	Water	3510C	
240-78922-5	GW-18224-050117-DC-005	Total/NA	Water	3510C	
240-78922-6	GW-18224-050117-DC-006	Total/NA	Water	3510C	
MB 240-277475/20-A	Method Blank	Total/NA	Water	3510C	
LCS 240-277475/21-A	Lab Control Sample	Total/NA	Water	3510C	

### Prep Batch: 277477

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-78922-1	GW-18224-050117-DC-001	Total/NA	Water	3510C	
240-78922-2	GW-18224-050117-DC-002	Total/NA	Water	3510C	
240-78922-3	GW-18224-050117-DC-003	Total/NA	Water	3510C	
MB 240-277477/20-A	Method Blank	Total/NA	Water	3510C	
LCS 240-277477/21-A	Lab Control Sample	Total/NA	Water	3510C	
240-78922-3 MS	GW-18224-050117-DC-003	Total/NA	Water	3510C	
240-78922-3 MSD	GW-18224-050117-DC-003	Total/NA	Water	3510C	

### Analysis Batch: 277889

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-78922-1	GW-18224-050117-DC-001	Total/NA	Water	8270C	277477
240-78922-2	GW-18224-050117-DC-002	Total/NA	Water	8270C	277477
240-78922-3	GW-18224-050117-DC-003	Total/NA	Water	8270C	277477
MB 240-277477/20-A	Method Blank	Total/NA	Water	8270C	277477
LCS 240-277477/21-A	Lab Control Sample	Total/NA	Water	8270C	277477
240-78922-3 MS	GW-18224-050117-DC-003	Total/NA	Water	8270C	277477
240-78922-3 MSD	GW-18224-050117-DC-003	Total/NA	Water	8270C	277477

### Analysis Batch: 277930

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-78922-4	GW-18224-050117-DC-004	Total/NA	Water	8270C	277475

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# QC Association Summary

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## GC/MS Semi VOA (Continued)

### Analysis Batch: 277930 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-78922-5	GW-18224-050117-DC-005	Total/NA	Water	8270C	277475
240-78922-6	GW-18224-050117-DC-006	Total/NA	Water	8270C	277475
MB 240-277475/20-A	Method Blank	Total/NA	Water	8270C	277475
LCS 240-277475/21-A	Lab Control Sample	Total/NA	Water	8270C	277475

# Lab Chronicle

Client: GHD Services Inc.  
Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: GW-18224-050117-DC-001**

Date Collected: 05/01/17 10:05

Date Received: 05/02/17 11:15

**Lab Sample ID: 240-78922-1**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		33.33	278134	05/09/17 13:35	LEE	TAL CAN
Total/NA	Prep	3510C			277477	05/04/17 08:36	KEH	TAL CAN
Total/NA	Analysis	8270C		1	277889	05/08/17 10:20	TMH	TAL CAN

**Client Sample ID: GW-18224-050117-DC-002**

Date Collected: 05/01/17 10:20

Date Received: 05/02/17 11:15

**Lab Sample ID: 240-78922-2**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		33.33	278134	05/09/17 13:58	LEE	TAL CAN
Total/NA	Prep	3510C			277477	05/04/17 08:36	KEH	TAL CAN
Total/NA	Analysis	8270C		1	277889	05/08/17 10:44	TMH	TAL CAN

**Client Sample ID: GW-18224-050117-DC-003**

Date Collected: 05/01/17 12:15

Date Received: 05/02/17 11:15

**Lab Sample ID: 240-78922-3**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		8	278134	05/09/17 14:20	LEE	TAL CAN
Total/NA	Prep	3510C			277477	05/04/17 08:36	KEH	TAL CAN
Total/NA	Analysis	8270C		1	277889	05/08/17 07:57	TMH	TAL CAN

**Client Sample ID: GW-18224-050117-DC-004**

Date Collected: 05/01/17 12:40

Date Received: 05/02/17 11:15

**Lab Sample ID: 240-78922-4**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	278134	05/09/17 14:43	LEE	TAL CAN
Total/NA	Prep	3510C			277475	05/04/17 08:32	KEH	TAL CAN
Total/NA	Analysis	8270C		1	277930	05/08/17 17:45	JMG	TAL CAN

**Client Sample ID: GW-18224-050117-DC-005**

Date Collected: 05/01/17 14:05

Date Received: 05/02/17 11:15

**Lab Sample ID: 240-78922-5**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		25	278134	05/09/17 15:06	LEE	TAL CAN
Total/NA	Prep	3510C			277475	05/04/17 08:32	KEH	TAL CAN
Total/NA	Analysis	8270C		5	277930	05/08/17 18:33	JMG	TAL CAN

TestAmerica Canton

# Lab Chronicle

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

**Client Sample ID: GW-18224-050117-DC-006**

Date Collected: 05/01/17 14:45

Date Received: 05/02/17 11:15

**Lab Sample ID: 240-78922-6**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		3.33	278328	05/10/17 12:32	LEE	TAL CAN
Total/NA	Prep	3510C			277475	05/04/17 08:32	KEH	TAL CAN
Total/NA	Analysis	8270C		1	277930	05/08/17 18:09	JMG	TAL CAN

**Client Sample ID: TB-18224-050117**

Date Collected: 05/01/17 00:00

Date Received: 05/02/17 11:15

**Lab Sample ID: 240-78922-7**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	278134	05/09/17 15:50	LEE	TAL CAN

## Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

# Accreditation/Certification Summary

Client: GHD Services Inc.

Project/Site: 18224, Arkema Halowax Area

TestAmerica Job ID: 240-78922-1

## Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	04-30-17 *
Connecticut	State Program	1	PH-0590	12-31-17
Florida	NELAP	4	E87225	06-30-17 *
Illinois	NELAP	5	200004	07-31-17 *
Kansas	NELAP	7	E-10336	01-31-18
Kentucky (UST)	State Program	4	58	02-23-18
Kentucky (WW)	State Program	4	98016	12-31-17
Minnesota	NELAP	5	039-999-348	12-31-17
Minnesota (Petrofund)	State Program	1	3506	07-31-17 *
Nevada	State Program	9	OH-000482008A	07-31-17 *
New Jersey	NELAP	2	OH001	06-30-17 *
New York	NELAP	2	10975	03-31-18
Ohio VAP	State Program	5	CL0024	09-14-17
Oregon	NELAP	10	4062	02-23-18
Pennsylvania	NELAP	3	68-00340	08-31-17 *
Texas	NELAP	6	T104704517-15-5	08-31-17 *
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-17
Washington	State Program	10	C971	01-12-18
West Virginia DEP	State Program	3	210	12-31-16 *
Wisconsin	State Program	5	999518190	08-31-17 *

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Canton

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Brighton, MI 48116  
Phone: 810.229.2763 Fax:

MICHIGAN Chain of Custody Record 197541  
41.2 / 3.9 2.4 / 2.1

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING  
TestAmerica Laboratories, Inc.  
TEL: 8210 (0713)

Regulatory Program:  DW  NPDES  RCRA  Other:

Client Contact		Project Manager: P. Swanson	Site Contact: J. Castle	Date: 5/1/17
Company Name: GHD Services Inc.	Tel/Fax: 714-43-5123	Lab Contact: J. Castle	Carrier: FedEx	COC No. JQ17-05-01
Address: 14456 Sheldon Rd. Ste. 200	Analysis Turnaround Time			
City/State/Zip: Plymouth MI 48170	<input type="checkbox"/> CALENDAR DAYS	<input type="checkbox"/> WORKING DAYS		
Phone: 734-453-5127	TAT if different from Below			
Fax:	<input checked="" type="checkbox"/>	2 weeks		
Project Name: Arkansas Flebency Area	<input checked="" type="checkbox"/>	1 week		
Site: Wastehite RT	<input checked="" type="checkbox"/>	2 days		
P.O # 18224-000	<input checked="" type="checkbox"/>	1 day		
Sample Identification				
Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	# of Matrix	Filtered Sample (Y/N)
5/1/17	10:35	G	5	X X
-002	10:20		5	
-003	11:05		13	X
-004	12:40		5	
-005	14:05		5	
-006	14:55		5	
-007	14:55		5	
-008	14:55		5	
-009	14:55		5	
-010	14:55		5	
-011	14:55		5	
-012	14:55		5	
-013	14:55		5	
-014	14:55		5	
-015	14:55		5	
-016	14:55		5	
-017	14:55		5	
-018	14:55		5	
-019	14:55		5	
-020	14:55		5	
-021	14:55		5	
-022	14:55		5	
-023	14:55		5	
-024	14:55		5	
-025	14:55		5	
-026	14:55		5	
-027	14:55		5	
-028	14:55		5	
-029	14:55		5	
-030	14:55		5	
-031	14:55		5	
-032	14:55		5	
-033	14:55		5	
-034	14:55		5	
-035	14:55		5	
-036	14:55		5	
-037	14:55		5	
-038	14:55		5	
-039	14:55		5	
-040	14:55		5	
-041	14:55		5	
-042	14:55		5	
-043	14:55		5	
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-046	14:55		5	
-047	14:55		5	
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-061	14:55		5	
-062	14:55		5	
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-064	14:55		5	
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TestAmerica Canton Sample Receipt Form/Narrative Canton Facility				Login # : 78922
Client GHD	Site Name	Cooler unpacked by: 		
Cooler Received on 5-2-17	Opened on 5-2-17			
FedEx: 1 <sup>st</sup> Grd EXP	UPS FAS Clipper	Client Drop Off	TestAmerica Courier	Other
<b>Receipt After-hours:</b> Drop-off Date/Time Storage Location				
TestAmerica Cooler #	Foam Box	Client Cooler	Box	Other
Packing material used:	Bubble Wrap	Foam	Plastic Bag	None Other _____
COOLANT:	Wet Ice	Blue Ice	Dry Ice	Water None
1.	Cooler temperature upon receipt <input checked="" type="checkbox"/> See Multiple Cooler Form			
	IR GUN# IR-8 (CF -0.3 °C)	Observed Cooler Temp.	°C	Corrected Cooler Temp. °C
	IR GUN #36 (CF +0.8°C)	Observed Cooler Temp.	°C	Corrected Cooler Temp. °C
2.	Were custody seals on the outside of the cooler(s)? If Yes Quantity _____ Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
	-Were custody seals on the outside of the cooler(s) signed & dated?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
	-Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
3.	Shippers' packing slip attached to the cooler(s)? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
4.	Did custody papers accompany the sample(s)? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
5.	Were the custody papers relinquished & signed in the appropriate place? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
6.	Was/were the person(s) who collected the samples clearly identified on the COC? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
7.	Did all bottles arrive in good condition (Unbroken)? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
8.	Could all bottle labels be reconciled with the COC? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
9.	Were correct bottle(s) used for the test(s) indicated? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
10.	Sufficient quantity received to perform indicated analyses? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
11.	Are these work share samples? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
If yes, Questions 11-15 have been checked at the originating laboratory.				
11.	Were sample(s) at the correct pH upon receipt? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> pH Strip Lot# HC697954			
12.	Were VOAs on the COC? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
13.	Were air bubbles >6 mm in any VOA vials?  Larger than this. Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA			
14.	Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes <input type="checkbox"/> No <input type="checkbox"/>			
15.	Was a LL Hg or Me Hg trip blank present? _____ Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____				
Concerning _____				

## **16. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES**

Samples processed by:

## 17. SAMPLE CONDITION

Sample(s) \_\_\_\_\_ were received after the recommended holding time had expired.  
Sample(s) \_\_\_\_\_ were received in a broken container.  
Sample(s) \_\_\_\_\_ were received with bubble >6 mm in diameter. (Notify PM)

## 18. SAMPLE PRESERVATION

Sample(s) \_\_\_\_\_ were further preserved in the laboratory.  
Time preserved: \_\_\_\_\_ Preservative(s) added/Lot number(s): \_\_\_\_\_

